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Vol. 116, No. 9 Thursday, March 4, 1943 Price Ten Cents

Newsprint Price is Increased to $54 a Ton

Office of Price Administration and Canadian Wartime Prices And Trade Board Announce $4 Per Ton Raise Effective on March 1—Canada Considers Increase Too Small to Cover Higher Costs.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, Feb. 27, 1943—An increase of $4 a ton in the ceiling price of standard newsprint was announced tonight by the Office of Price Administration and the Canadian Wartime Prices and Trade Board.

The increase, first in five years, is effective March 1. It brings the new "port" ceiling price of newsprint to $54 a ton, with zone prices adjusted accordingly.

It has been the subject of extended conversations between the OPA and the Canadian board.

The two agencies said in a joint statement that a $4 increase had been agreed upon at this time, but that the agreement would not prejudice further review of the price situation at a later date.

Higher Price Viewed Justified

The Canadian board had held that the $4 increase did not fully reflect increased costs to the Canadian industry, chief producer of newsprint used in this country.

According to Prentis M. Brown, OPA Administrator, the advance is necessary because the newsprint industry can no longer absorb increased wartime costs. He said that woods operation and cost of transportation had risen and water-borne shipments had decreased, with the result that the newsprint industry's position had deteriorated further.

Nine of the thirteen United States newsprint manufacturers were operating at a loss, the OPA reported.

"Newsprint is one of the few major commodities that has not increased in price since the war broke out in 1939," Mr. Brown stated.

"Ever since that time, and even more in the past year," he added, "newsprint transportation and production costs have risen sharply with the result that a large segment of the industry is losing money on every ton of newsprint delivered, while the profits of those companies which still are operating in the black are shrinking rapidly.

Cost Changes Create Unfair Level

"The increase, insofar as the American industry is concerned, is clearly one which is in strict conformity with the Emergency Price Control Act as amended. Cost changes since 1938 have rendered prices established five years ago no longer fair and equitable.

"The Office of Price Administration must supply a standard both impartially and rigorously. It must act on those standards whether, as in the vast majority of cases, it involves the denying of price increases, or, as in the much rarer instance, it involves granting a price advance where cost changes have rendered the situation of an industry genuinely intolerable.

"The decision to permit a price rise of $4 a ton has been reached only after the most careful study and after extensive discussions with newsprint producers and with particularly close consideration of the problems of all branches of the publishing industry. In the light of all evidence, however, no other course is possible without seriously impairing the operation of an important industry and jeopardizing the supply of newsprint."

Canada Terms Raise Insufficient

[FROM OUR REGULAR CORRESPONDENT]

OTTAWA, Feb. 28, 1943—The Prices Board announced today that, effective tomorrow, the ceiling on newsprint in Canada will be raised by $4 a ton to conform with an increase of the same amount concurrently announced in the United States.

The board's announcement said that during the last year it has been conducting a careful examination of the costs and operations of the newsprint industry so as to be able to discuss with United States authorities the increase necessary to meet increased costs of woods operations, transportation and other wartime factors.

Donald Gordon, chairman of the Prices Board, said representations were still before Washington showing that his $4 increase is "much too small" to cover increased costs so as to place the Canadian newsprint industry in a position to carry on at present levels of production. Consequently, said Mr. Gordon, discussion and examination of the situation are continuing.

No Raw Materials Shortage Foreseen in 1943

Wisconsin Paper Men State Manpower Shortage in Woods Will Reduce This Year's Pulpwood Cut But Stockpiles on Hand Assures Supply for This Year—Marathon Mills to Expand—Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., March 1, 1943—Although jobbers are pessimistic about the paper supply available to them as curtailment begins to be felt increasingly, Wisconsin mills which manufacture their own pulp do not look for a shortage of raw materials this year.

Addressing the Wisconsin Paper Merchants Association at Milwaukee, Wis., last week, L. E. Stevens, president, declared that the shortage of manpower in the woods would make it impossible for the Wisconsin paper industry to fill its curtailed 1943 production quota. He estimated the available supplies and anticipated cuttings of pulpwood at 8,500,000 tons. He said 15,000,000 tons would be required for current needs.

Mill owners declare, however, that this outlook is more applicable to early 1944 than to the 1943 production quota. They consider themselves fortunate to have large stockpiles of pulpwood on hand, and will not feel the shortage until they must turn to this winter's reduced cut.

The labor shortage has been particularly acute in Canada, from where Wisconsin mills procure about half of their requirements. Deep snow in forests and woodlots together with a large amount of rain last summer have contributed to the difficulties of pulpwood cutting in Wisconsin and upper Michigan as well as Canada. The selective service drain on experienced woodsmen, the high wages paid in Alaska and numerous other factors have helped to create a bottleneck this winter.

Only about 75% of the normal production was realized, according to estimates of mill executives, as compared to an urgent government request for increased production. Government and other essential uses are on the gain, with an estimated 50% of rag papers and 24% of sulphites and converted items now going directly to the government.

Marathon Co. Plans to Expand

The Marathon Paper Mills Company, Marathon, Wis., and other box board mills are planning to expand production materially, in view of the recent government order lifting all restrictions and nullifying the 80% maximum. Due to increased operating expenses, mills expect to use more waste paper and ground wood to keep within reasonable costs. They intend to utilize every possible means of making their present stockpiles reach as far as possible, hoping some relief will manifest iteself before the situation becomes acute.

J. R. Kimberly Named Vice-President

Kimberly-Clark Corporation, Neenah, Wis., announced last week that John R. Kimberly has been named vice-president in charge of sales by the board of directors. He will take over the work formerly handled by John S. Sensenbrenner, who resigned several months ago to serve in the United States Army with the rank of Major.

Mr. Kimberly was given a leave of absence about a year and a half ago while assistant general superintendent, to serve with the Office of Production Management in Washington, D. C. When the War Production Board replaced this agency, he was assistant director general for operations. He resigned his post last week to return to his company, and it was announced then by his immediate superior, Curtis E. Calder, director general, that he would return to WPB within two or three months.

At present Mr. Kimberly is taking a vacation and will assume his new duties about April 1.

Tom Utegaard to Serve with Navy

Tom Utegaard, assistant chief engineer of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., is taking a leave of absence to serve with the United States Navy. He has been commissioned a lieutenant-commander in the civil engineering corps reserve and has reported at Norfolk, Va., for training. He will join one of the combatant units of the Sea Bees, navy construction battalion, and will be assigned to foreign service.

Mr. Utegaard has been on Consolidated's staff for more than 22 years, and during World War I served overseas with the 56th Coast Artillery as a second lieutenant. One son, Tom, Jr., is a midshipman at the U. S. Naval Academy at Annapolis. Another son, John, is at the University of Wisconsin and expects to enter the armed forces soon. Mrs. Utegaard and son Rolf will remain in Wisconsin Rapids.

Mutual Benefit Group Reports

Benefits exceeding $100,000 were disbursed to members of the Mutual Benefit Association of the Kimberly-Clark Corporation, Neenah, Wis., during 1942, according to the reports submitted at the thirty-third annual meeting held recently. A total of $36,356 went out in daily benefits because of sickness, $24,693 for hospital and surgical relief, $18,133 in part payment of dental bills, and $5,975 for optical service.

The association is managed by a board of 17 trustees, 11 of whom are elected by the various mill and office units and six are appointed by the management. The corporation provides office space, pays staff salaries, and contributes approximately $3,000 in cash annually. It acts as banker for the association and pays interest on monthly balances, which in 1942 amounted to $2,394. Monthly assessments of members last year totalled $91,909.

Kimberly-Clark Mill Managers Meet

Staff members and mill managers of Kimberly-Clark Corporation held their annual 2-day meeting last week at the company's offices at Neenah, Wis., with about 50 attending. Plans and policies dealing with wartime operations were discussed. A dinner was held at the Boys Brigade building the evening of February 24, at which S. F. Shattuck, vice-president, was the speaker. He related his experiences

while taking part in army camp life with other business executives early this year at Fort Leavenworth, Kansas.

J. M. Holderby Talks on Sulphite Waste

Efforts of the Institute of Paper Chemistry to work out control and utilization of sulphite liquor waste in Wisconsin sulphite pulp mills were described by Jesse M. Holderby in an address to the Lions Club at Menasha, Wis., last week. He represents the pulp manufacturers' committee as consultant in connection with research work now in progress at the Institute at Appleton, Wis. He mentioned some of the problems involved, and also presented a review of the benefits derived from sewage disposal plants now in operation in the Fox River Valley. Mr. Holderby formerly was superintendent of the Neenah-Menasha sewage disposal plant.

A. T. Hudson Discusses Plant War Work

Another address of the week was made by A. T. Hudson, mechanical engineer of the Kimberly-Clark Corporation. He told the Rotary Club of Neenah, Wis., about the war work in progress at the company's plants, declaring that workers have been able to increase their efficiency 400% since the war emergency came. Three machine shops have been turned over for production of government war orders, he announced.

Parts and materials are being turned out for ships, some of which have gone into submarines being built at Manitowoc, Wis., and others for the barges used in the North African campaign. Difficulties were experienced at first, he said, when rejections were 30 to 35% because materials were not up to strict specifications, but now their acceptance is practically 100%.

Mory-Gilbert Engagement Announced

The engagement was announced last week by Mrs. K. B. Mory, Neenah, Wis., of her daughter, Barbara, to Private William Gilbert, Washington, D. C., son of Mr. and Mrs. George Gilbert. Private Gilbert's father is vice-president of the Gilbert Paper Company, Menasha, Wis. The young man is with the Signal Corps of the army. No date has been announced for the wedding.

Paper Mobilizes for Red Cross Drive

Under the leadership of Adam K. Luke, vice-president of the West Virginia Pulp and Paper Company, the paper industry of New York has mobilized its personnel and resources for an all-out effort to support the 1943 Red Cross War Fund which launched a campaign for $13,000,000, on March 1. The national goal is $125,000,000.

At a luncheon held February 26 in the Union League Club, leaders of the industry heard an inspiring address on the needs and purposes of the Red Cross by Elliott H. Lee, vice-president of Guaranty Trust Company and executive vice-chairman of the Commerce and Industry Committee of the War Fund, and the eye-witness story of the fall of Malava and Singapore by Cecil Brown, famous war correspondent, who was aboard H.M.S. Repulse when the battle cruiser was sunk by Japanese planes.

The Commerce and Industry Committee of which the paper industry forms a major unit is headed by Eugene W. Stetson, president of the Guaranty Trust Company; Bernon S. Prentice, formerly of the firm of Dominick & Dominick, and Mr. Lee.

Among the leaders in the paper trade who will conduct an active campaign are:

PAPER COMMITTEE:—Adam K. Luke, Chairman, vice-president and treasurer of West Virginia Pulp and Paper Company; E. S. Johnson, assistant treasurer of West Virginia Pulp and Paper Company.

BOOK AND COATED PAPER DIVISION:—H. J. Chisholm, president, Oxford Paper Company; Harold Hopkins, Oxford Paper Company; J. P. Osborne, New York manager, Champion Paper and Fibre Company.

FINE AND SPECIALTIES DIVISION:—W. B. Merlin, vice-president, Hollingsworth & Whitney Company; Edward Bailey, Hollingsworth & Whitney Company; Fred W. Cole, president, Fraser Industries, Inc.; John I. Riegel, president, Riegel Paper Corporation.

KRAFT PAPER DIVISION:—R. K. Ferguson, president, St. Regis Paper Company; Isaac Gilman, president, Gilman Paper Company.

NEWSPRINT DIVISION:—H. H. Werley, secretary, Newsprint Service Bureau; H. S. Chalfant, president, H. S. Chalfant Co., Inc.

WHOLESALE PAPER MERCHANTS (BAG, PAPER CUPS, AND SPECIALTIES) DIVISION: — Harry Nias, president, Lily Tulip Cup Company; F. E. Ruhling, vice-president, Lily Tulip Cup Company.

PAPER MERCHANTS DIVISION: — J. O. Bulkley, partner, Bulkley, Dunton & Co.; Gustave C. Indruk, president, Tappen & Indruk Company; D. S. Landau, vice-president, Alling & Cory Company; A. L. Kennelly, president, Kennelly Paper Company, Inc.; Thomas Goulard, president, Walker, Goulard & Plehn Company, Inc.

PULP AGENTS DIVISION:—A. J. Sigel, vice-president, Gottesman & Co., Inc.; R. T. Vanderbilt, president, R. T. Vanderbilt Company; Johannes Westergaard, vice-president, Castle & Overton, Inc.

PAPER BOX DIVISION:—Samuel Kipnis, president, National Container Corp.; David H. Rous, sales manager, Grand City Container Corp.; A. Dorfman, president, A. Dorfman & Company; W. F. Howell, secretary, Robert Gair Company, Inc.; H. E. Roden, secretary, New York District Paper Box Ass'n.

OLD PAPER DIVISION: — J. A. Benedetto, president, D. Benedetto, Inc.; Sol Ash, president, Sol Ash, Inc.

ENVELOPE DIVISION:—H. J. Smith, vice-president, Berlin & Jones Company, Inc.

Edmund Stevens to Speak at Boston

BOSTON, Mass., March 1, 1943—Edmund Stevens, war correspondent for the *Christian Science Monitor*, is to be the speaker at the Annual Meeting of the Boston Paper Trade Association, to be held April 8 at the Algonquin Club. Mr. Stevens, who arrived from the African war front by clipper plane last week, flew from Casablanca to Turkey with Churchill and to Moscow with Willkie. He is booked for speaking engagements until the middle of April. The reason for the postponement of the meeting from the third Wednesday in March, when it is usually held, is that Governor Saltonstall some weeks ago asked to have meetings of organizations deferred until later due to congestion of traffic brought about by possible snow, etc.

High Paper Demand Maintained in Chicago

Backlog Orders Up to Sixty Days Are Reported But Price Situation Is Considered To Be Unfavorable, With Transportation Difficulties Increasing — Waste Paper Dealers Ask for Pay Raise.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., March 1, 1943—The Chicago paper trade continues to be in a definite "bull market with the backlog orders extending from thirty to sixty days and even more in many instances. It is reported here that the heavy demand will certainly continue for the first quarter of the year and possibly much longer, depending in part on government pronouncements and on a carefully applied and developed conservation program. Those returning from the very successful New York meetings of the industry reported that local conditions are in evidence in all parts of the country and that the many new uses for paper and paper board are simply adding "fuel to the flames" as one local paper executive expressed it.

The price situation is said to be somewhat unfavorable, as current prices press the 1942 ceiling tops without a suitable "cost plus" arrangement to cover wage and raw commodity "freezes," which came months later than the freeze on all lines in general. Transportation difficulties are increasing steadily and the recent pronouncements by War Man Power Commissioner Paul V. McNutt have not afforded any relief from this standpoint.

Specifically, krafts, books, groundwoods and sulphites all found more than ready markets during the week. Covers were also strong and specialties, almost without exception, found plenty of interest. The board market was strong in tone while waste papers were growing stronger and stronger as increased uses, poor collections and other factors have reduced the available supply, according to local waste paper concerns.

Box Situation Worries Retailers

The Chicago retail trade continues to view the paper box situation with grave concern and it is expected that industry meetings will be held within the next week to carefully review the situation. According to local reports, the folding box industry has been told that pulp is going to be needed for the war program and that the definite shortage will make it necessary for waste papers to be used in the manufacture of folding boxes. On the other hand, reports persist that there is and will be sufficient pulp and the retail trade is wondering just where it will get the correct balance to determine its future position. "If a customer buys any commodity that must be carried or delivered in a paper box," decleared one Chicago store executive, "she is going to have a very hard time with a box made of waste paper. It will be flimsy and it must of necessity be taped to give it any permanence. If not, goods will be lost, damaged or even stolen in transit and the corner hooked boxes which would be made of flimsy materials would actually mean more waste than might be incurred if better materials were used. At the present time it is possible that many of the larger merchants are well stocked with boxes for the next few months. But they are looking beyond that date and are obviously anxious to tackle the problem before the situation is at its worst."

Roach as N. P. T. A. Head Welcomed Here

The election of C. E. Roach as president of the National Paper Trade Association was a happy choice so far as his many friends in Illinois who are familiar with his ability are concerned. Oftentimes, according to local and State business men, business executives are too prone to be placed in national offices without regard for the very necessary groundwork which must be done at home. Such is not the case as far as Corwine Roach is concerned. The head of the Capitol City Paper Company, in Illinois' capital city, has been even more busy with State and local affairs than with regional and national paper industry jobs where he has always been cooperative. Mr. Roach has been closely associated with the vigorous work done by the Springfield Chamber of Commerce in his own home town and has served in many official capacities for that organization. He has long been a director of the Illinois Chamber of Commerce and has served as vice-president of his particular district which also includes the representation of another active Illinois paper executive, B. C. Hopper of the Hopper Paper Company at Taylorville. Mr. Roach has also served most efficiently as the chairman of the State Chamber's important legislative committee. He has also found time to enter fully into the community life of Springfield and has contributed materially to the welfare of his State. The qualities he has exhibited in his connections in Illinois are expected to carry the N.P.T.A. to new heights of service in one of the most critical years in the history of the industry.

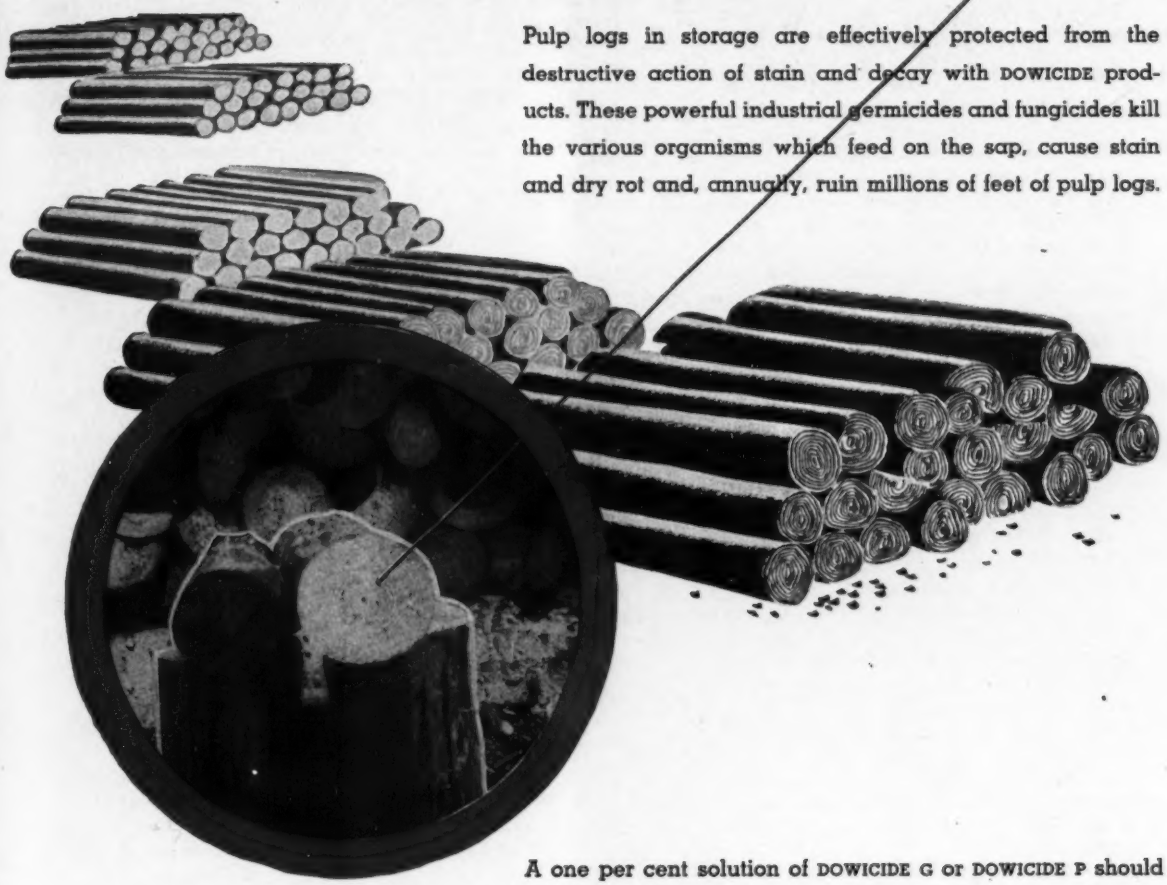
Ask Wage Increases for Waste Yard Workers

It is reported locally that Robert K. Byrnes, regional director of the War Labor Board, is endeavoring to get confirmation on a decision reached here this week to petition for wage increases for scrap yard workers in this area. Chicago scrap dealers, including waste paper dealers, have asked for the raise on the ground that they could not compete for labor on an equal basis with higher paying war concerns. It was reported that wage raises of from 70 to 80 cents an hour compared to the current 60 cents an hour rate were being sought by an industry which is quoted as having definitely assumed a more and more important status in relation to the overall war effort.

Diggs Appointment Popular

Considerable satisfaction was registered here over the appointment of John Diggs of the Mosinee Paper Mills Company to the Wrapping Paper Industry Committee recently appointed by the War Production Board. Mr. Diggs was long an active figure in Chicago paper circles before his recent transfer to the mills at Mosinee and local paper executives are confident he is well versed on what is what and what is needed in the wrapping paper industry.

How to safeguard valuable pulp logs in storage



Pulp logs in storage are effectively protected from the destructive action of stain and decay with DOWICIDE products. These powerful industrial germicides and fungicides kill the various organisms which feed on the sap, cause stain and dry rot and, annually, ruin millions of feet of pulp logs.

Pulp log at left untreated—log at right protected by dipping in 1% Dowicide solution.

A one per cent solution of DOWICIDE G or DOWICIDE P should be applied as soon as possible after cutting, preferably within 24 hours. Treating can be done in the woods or at the time of unloading the logs at the banking location.

For complete information on how to safeguard valuable pulp logs in storage, write to Dow requesting DOWICIDE bulletin No. 42.

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Los Angeles • Seattle

Other Protective Services Provided by Dowicide:

For the preservation of lap and pulp stock—DOWICIDE P or G. For longer felt life—DOWICIDE G. For the preparation of mold-resistant paper products—DOWICIDE A, B and G. For the prevention of decay and termite attack—DOWICIDE G. For controlling slime conditions—various combinations of DOWICIDE with other materials. For reducing maintenance costs—DOWICIDE 7, preserves structural timbers; DOWICIDE 6, protects paint film from mold growths.

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Government Paper Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 3, 1943—The Marquette Paper Company has been awarded the contract for furnishing the Government Printing Office with 65,000 pounds of chemical wood manila paper at 5.75 cents. Other paper awards recently made by the Printing Office include the following.

Zellerbach Paper Company will furnish 17,783 pounds of white chemical wood writing paper at 7.37 cents and the Franklin Research Company will furnish 230,220 pounds of 50% rag, white litho finish chart paper at 18.625 cents. Crocker, Burbank Papers Inc., will furnish 955 pounds of aeronautical chart fluorescent paper at 35 cents, and the same firm will furnish 44,541 pounds of same at the same price.

Cauthorne Paper Company will furnish 50,000 pounds of 25% rag, mimeograph paper at 8.75 cents and the Old Dominion Paper Company will furnish 50,000 pounds of same at 8.93 cents. Bulkley, Dunton & Co. will furnish 336,094 pounds of wood manila paper at 4.75 cents. Middlesex Products Corporation, will furnish 4,000 sheets of Quaker drab cloth lined cover paper at $150.00 per M sheets.

Walker Goulard Plehn Company will furnish 123,676 pounds of white chemical wood writing paper at $7.60 and $8.40 per C pounds and the same firm will also furnish 73,629 pounds of yellow chemical wood writing paper at $8.65 per C pounds. Cauthorne Paper Company will furnish 24,704 pounds of white chemical wood writing paper at 6.39 cents.

Barton, Duer & Koch Paper Company will furnish 116,531 pounds of cream post card at 7.45 cents and the same firm will also furnish 40,000 pounds of white machine finish book paper at 7.14 cents. R. P. Andrews Paper Company will furnish 43,140 pounds of chemical wood manila paper at 7.65 cents and Crocker Burbank, Papers Inc., will furnish 124,900 pounds of white offset book paper at 7.57 cents. Eastern Corporation will furnish 23,000 pounds of yellow chemical wood writing paper at 7.25 cents. Walker Goulard Plehn Company will furnish 125,000 pounds of white M.F. book paper at 6.98 cents and the same firm will furnish 125,000 pounds of white M.F. paper at 6.98 cents.

The Marquette Paper Company will furnish 490,000 pounds of white M.F. book paper at 7.31 cents and Ditto, Inc., will furnish 128,000 pounds of chemical wood writing paper at 10.4 and 11.15 cents. Marquette Paper Company will also furnish 674,000 pounds of poster paper at 7.3 cents and Bermingham & Prosser will furnish 28,800 pounds of 100% rag, cream white antique book paper at 15.33 cents. Marquette Paper Company will furnish 204,000 pounds of white M.F. book paper at 7.3 cents and R. P. Andrews Paper Company will furnish 48,900 pounds of tan rope bristol cover paper at 10.25 cents.

Marquette Paper Company will furnish 117,950 pounds of offset poster paper at 70 cents and the same firm will also furnish 662,731 pounds of ground wood writing paper at 11.84 cents. Nashua Gummed and Coated Paper Company will furnish 299,750 pounds of ground wood writing paper at 12.35 cents and the Cauthorne Paper Company will furnish 2,000 pounds of white stereotype molding paper at 12 cents. Whitaker Paper Company will furnish 133,000 sheets of white cloth lined cover paper at $116.67 per M sheets and Barton, Duer & Koch Paper Company will furnish 74,230 pounds of cream post card bristol board at $6.75 per cwt.

Central Ohio Paper Company will furnish 13,006 pounds of 25% rag, white bond paper at $11.23 per cwt. The Stanford Paper Company will furnish the following; 9,424 pounds of 25% rag, white bond paper at 11.35; same quantity of blue bond paper at 12.10 cents; same yellow at 12.10 cents; same salmon at 12.10 cents.

R. P. Andrews Paper Company will furnish 184,863 pounds of white chemical wood writing paper at 6.42 cents and the Cauthorne Paper Company will furnish 113,990 pounds of the same at $37,454.03. Marquette Paper Company will furnish 218,714 pounds of white chemical wood writing paper at 7.1 cents. D. L. Ward Company will furnish 25,700 pounds of white chemical wood writing paper at $6.74 per cwt. and 66,138 pounds same at same price. Walker Goulard Plehn Company will furnish 99,442 pounds of white sulphite writing paper at 6.97 cents; also 20,218 pounds of blue same at 8 cents and 64,090 pounds of yellow chemical wood writing paper at $8.15 per cwt.

Central Ohio Paper Company will furnish 40,507 pounds of salmon chemical wood writing paper at 7.24 cents; 53,053 pounds same yellow at 7.24 cents and 29,191 pounds of same yellow at 7.24 cents. Wilcox Walter Furlong Paper Company will furnish 100,000 pounds of antique book paper at 6.9 cents and the Franklin Research Company will furnish 167,385 pounds of 50% rag, litho finish chart paper at 18,625 cents.

Union Bag Plans Halted by Army

[FROM OUR REGULAR CORRESPONDENT]

GLENS FALLS, N. Y., March 1, 1943—The Union Bag and Paper Corporation has announced that anticipated contract for war work at its Hudson Falls plant, which was expected to have provided employment for several hundred persons, will not be carried through, due to a change in engineering plans by the Army and Navy.

In a statement issued from its New York offices the company said:

"Due to a change in engineering plans by the Army and Navy, the anticipated contract for war work recently announced by Union Bag and Paper Corporation will not be carried through. President Alex Calder said that while official notice of the cancellation has not reached him, the company has been asked to stop any further development work in connection with the war contract.

"The company has been working for many months on plans and production schedules, and considerable money and time have been spent in preparation for the work to be done here (at Hudson Falls).

" 'It is a matter of great disappointment to our company,' Mr. Calder said, 'that circumstances have prevented our proceeding with this war order. However, we are conducting a thorough search for other war work which might make use of the company's experience and manufacturing facilities'."

Instrumentation Studies. XLIII*

Part IV: The Schopper Electrically Driven Strength Tester Measurement of the Tensile Strength of Paper

By the Staff of The Institute of Paper Chemistry

Abstract

The electrically driven Schopper strength tester is described. Errors were found in the calibration of one instrument, presumably typical. These errors are not serious in many control problems, but they might be serious in other cases. The error appears to be due to inaccuracy in division of the scale and not to a fundamental fault in design of the instrument; therefore it could be corrected by the manufacturer.

Louis Schopper of Leipzig, Germany, manufactures a number of models of tensile strength testers. These instruments are distributed in this country by Testing Machines, Inc., New York, N. Y. The particular instrument studied is a pendulum-type instrument of 75-pound capacity.

The instrument is equipped with a device for measuring the elongation of the specimen; since the investigation of the measurement of stretch is incomplete, this feature of the instrument will not be discussed at this time.

Part I of this series (Instrumentation Studies XL (*1*)) is a general discussion of the factors affecting the measurement of tensile strength; therefore this part will deal only with the specific characteristics of this particular instrument.

Description of the Instrument

A photograph of the instrument is shown in Fig. 1. The instrument is of the pendulum type and has two ranges: 0 to 15 pounds and 0 to 75 pounds with scales divided to 1/32 pound and ¼ pound, respectively. The upper specimen clamp is fastened to a chain which passes around and is anchored to a quadrant coaxial with the bearing of the pendulum. The lower specimen clamp is fastened to a rod which is drawn downward by means of the motor-driven gear box. The speed of the lower clamp is continuously variable from 2 to 20 inches per minute. These clamp speeds afford rates of loading varying approximately from 0.6 to 6 pounds per second on the 75-pound scale and approximately from 0.12 to 1.2 pounds per second on the 15-pound scale. The separation of the clamps is adjustable to distances of 2, 4, 6, and 8 inches. In this particular instrument an extra hole was drilled in the rod which holds the lower clamp to permit a specimen test length of 7.09 inches (180 mm.). The scales are marked on a quadrant which also bears teeth which engage the pawls fastened to the pendulum to hold the pendulum in its position of maximum displacement after the specimen breaks. The lower clamp is returned to its starting position by moving the operating lever to its upper position. The complete instrument, including the motor, is mounted upon a base.

The base of the instrument was not provided with levelling screws. Special screws were placed on the base and the instrument was levelled. The pawls were arrested by wedging with a folded strip of paper, and the pointer was brought to the zero of the scale by further adjustment of the level of the instrument. No other means of adjusting the zero of the scale is provided.

The calibration of the scale was then examined by suspending known weights from the upper clamp and noting the corresponding readings on the scale. The pawls were arrested and the instrument was tapped to eliminate any effects of friction during this calibration process. Table I lists the values of the dead-weight loads and the corresponding scale readings.

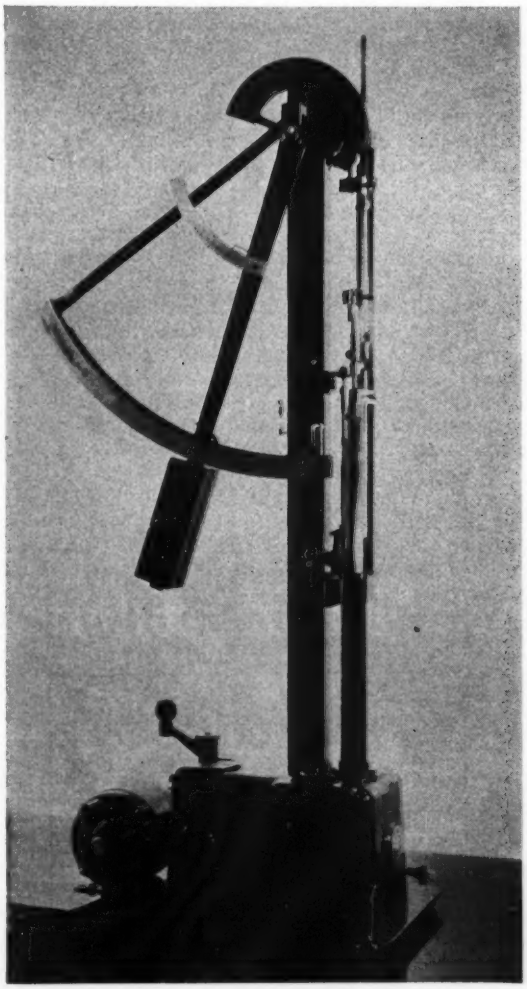


FIG. 1
Schopper Strength Tester

* This report is one of a series issued as a part of the instrumentation program of the American Paper and Pulp Association.

March 4, 1943

TABLE I.—CALIBRATION OF SCALES
(With Dead Weights)

Scale	Applied Load lb.	Scale Reading lb.
A	2.22	2.22
0-15 lb.	3.04	3.05
	5.05	5.09
	8.99	8.99
	14.37	14.41
B	5.1	5.1
0-75 lb.	9.0	8.9
	14.4	14.2
	24.9	24.8
	40.5	40.6
	49.6	49.6

The scale for the 15-pound range is seen to be noticeably in error near five pounds and the 75-pound range is seen to be in error in the lower part of the scale.

These errors appear to be due to inaccuracy in division of the scale. The accuracy of division of both scales was tested in the manner described in Part II of this series (Instrumentation Studies XLI (*2*)) in the section on calibration of the instrument. The solid circles and the curve of Fig. 2 represent the calculated points and the open circles represent the observed points for the 75-pound range. Figure 3 presents the corresponding data for the 15-pound range. As was previously discussed, the observed points for the scale should fall upon a smooth curve. The particularly wide deviation of the point from the smooth curve in Fig. 2 at a scale reading of approximately nine pounds is in agreement with the discrepancies in the scale noted in Table I. The fact that the plotted points in Fig. 2 are too high at the scale reading of nine pounds means that the scale divisions are too long and therefore that the scale reads too low as compared with the true value. This is the case in Table I. Some of the points in Fig. 3 appear to scatter particularly badly near five pounds in agreement with the data of Table I.

The errors noted in either scale are not serious for many control problems. The 75-pound scale ordinarily would seldom be used for testing papers with tensile strengths as low as nine pounds. The error at 14 pounds comes at a range which would frequently be used. For some purposes the error at this point of the 75-pound scale would be serious. Since the errors appear to be due to inaccuracy of division of the scale, the manufacturer can correct the trouble by more careful calibration.

Frictional effects are entirely negligible in this instrument. When the pawls are arrested, the pendulum will vibrate or oscillate a large number of times before coming to rest. During the calibration, when dead-weight loads were applied to the pendulum and the instrument was tapped, no change in position of the pointer on the scale was noted.

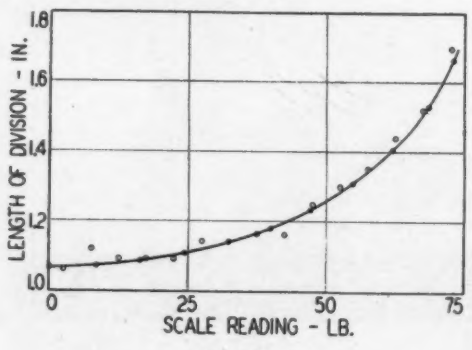


FIG. 2
Relationship Between Length of Scale Division and Scale Reading

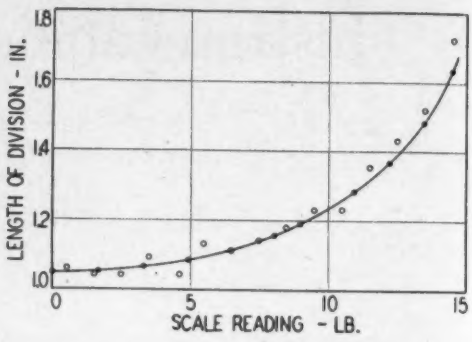


FIG. 3
Relationship Between Length of Scale Division and Scale Reading

The tensile strengths of a number of papers were measured with the Schopper instrument and with another instrument whose calibration had been carefully studied. After correction for errors in calibration, the results obtained with the two instruments agreed very satisfactorily.

Conclusions

The instrument is well constructed and finished. The scales are well placed for ease of reading. The scales, particularly the 15-pound scale, would be easier to read if they were decimally divided. There appears to be no need for having a scale divided in ounces or half ounces. It is strongly urged that when English units are used the scales be divided into pounds and decimal fractions of a pound.

It would be convenient to have the base of the instrument equipped with levelling screws.

The variable speed gear drive is unusually convenient and smooth in operation. At the higher speeds of operation, there is some tendency for the pendulum to jerk and vibrate as operation is started.

Literature Cited

(1) The Institute of Paper Chemistry, Paper Trade J. 115, no. 5: 12; no. 7: 14; no. 19: 18 (July 30, Aug. 13, Nov. 5, 1942).
(2) The Institute of Paper Chemistry, Paper Trade J. 115, no. 26: 14 (Dec. 24, 1942).

WPB Issues New Print Paper Order

WASHINGTON, D. C., March 3, 1943—Provisions of Limitation Order L-241, governing the use of commercial print paper, have been relaxed for the benefit of public utilities and companies doing work for any governmental agency. Action was taken through the issuance by the WPB Director General for Operations of L-241 as amended.

Under the terms of L-241, paper produced by or for the account of any governmental agency, Federal, State, or local, was exempt. Action further exempts paper necessary for the production of, delivery to, or use of products by any such department or agency. This would mean, for example, time cards used by a factory having a contract with the government, because the time cards are essential to the production of the particular article being made for the government. However, a vast amount of printed matter used in a plant is not exempt because it is not essential to such production.

The amended order also exempts paper for the use of public utilities on the same basis, as well as printed matter required by law in connection with any Federal, State, County, or Municipal tax laws or regulations.

Plans for Superintendents Meeting

The National Convention of the American Pulp and Paper Mill Superintendents Association which will be held at the Commodore Hotel in New York City on June 15-17, 1943 will be featured by a program designed to aid in the war effort.

These plans for the Annual Convention of the Superintendents Association in June were formulated at a meeting of the Board of Trustees which was held at the Commodore Hotel on February 16th.

The highlights of the annual convention will include an exhibit of paper, paperboard, and paper products to show how paper is helping to win the war, the discussion of problems facing the pulp and paper industry as a result of the war by outstanding representatives of the war agencies, and a discussion of the important labor problems facing the industry.

The "Paper and the War" exhibit will be staged by the Industrial Affiliates Committee which arranged the successful Maintenance and Conservation Forum held at the National Convention of the Superintendents Association last year.

The war uses for paper, paperboard, and paper products will be exhibited through the cooperation of the War Department and other Governmental agencies, the manufacturers of paper, paperboard, and paper products, as well as the companies who have developed new uses for paper in packaging their products. Because of the growing importance of the use of paper as a substitute material for critical metals, for packaging, and for new uses which are being developed daily, the superintendents who are responsible for production will find this "Paper and the War" exhibit of vital interest.

The tentative program for the National Convention will include discussions at the general sessions of the labor problems facing the industry, the question of the supply of pulpwood, pulp, and other essential materials, as well as general discussions of the effects of the war on the production of pulp and paper by outstanding representatives of the war agencies.

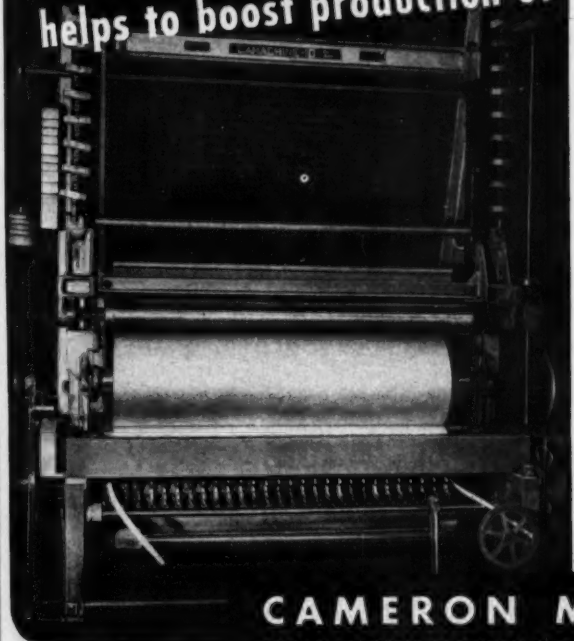
The group meetings which will be held will be featured by round table discussions of processing and maintenance problems. The superintendents and other operating men as well as representatives of the allied industry will be invited to attend and take part in these discussions at the various group meetings. Questions and answers on practical processing and maintenance problems will be taken up at the various group meetings and it is planned that both questions and answers will be published in booklet form.

It is also planned to have a cocktail party before the annual banquet on June 16 at which the Industrial Affiliates and representatives of the allied industries will be hosts.

All companies selling supplies and equipment to the pulp and paper mills will be invited to participate in this Cocktail Party which will be one of the social features of the Convention.

Because of the fact that New York is a famous vacation resort, it is expected that many superintendents and others attending the convention will combine their vacation plans with the visit to the Convention by bringing their wives with them in June.

CAMACHINE 10-14D
helps to boost production of Spiral Tube Containers



Camachine 10-14D winds rolls up to 60" in diameter, slits strips as narrow as ½". Speeds up to 1500 f.p.m. on paper, or 1000 f.p.m. on board. Can be furnished with score cut or shear cut slitter units according to needs of customer.

Keep spiral tube winders operating at top speed with rolls wound on Camachine 10-14D.

To meet staggering wartime requirements for powder, shell and ammunition containers, Spiral Tube Winding Machines must keep operating steadily at top speed. Camachine 10-14D helps to boost the production of spiral tube containers by supplying the tube-winding machines with ample quantities of firmly wound bored rolls, slit to the proper widths. Camachine 10-14D runs at 1000 f.p.m. on board rolls up to 50" diameter, winding on 9-15/16" drums to avoid cracking the board. Write today for interesting facts and figures concerning production obtainable with this equipment.

CAMERON MACHINE COMPANY
61 POPLAR STREET, BROOKLYN, N. Y. · MIDWEST OFFICE: 111 WEST MONROE STREET, CHICAGO

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending February 27, 1943

STOCKS

	High	Low	Last
A. P. W.	3⅛	2⅞	3
Armstrong Cork Co.	34	32½	33¼
Celotex Corp.	10⅞	10⅜	10⅞
Celotex Corp., pf.	88	87	87
Certain-Teed Products Corp.	4¼	4	4¼
Certain-Teed Products Corp., pf.	44⅞	39½	44⅞
Champion Paper & Fibre Co.	18½	18¼	18¼
Champion Paper & Fibre Co., pf.	104	103½	104
Congoleum Nairn Co.	19½	19	19¼
Container Corp. of America	21½	20½	21⅜
Continental-Diamond Fibre Co.	10½	9	10¼
Crown-Zellerbach Co.	13⅜	13	13½
Crown-Zellerbach Co., pf.	91	90	90
Dixie-Vortex Co.	12½	12	12½
Dixie-Vortex Co.—A	....	....	....
Flintkote Co.	19½	17¾	19¼
Robert Gair	3⅞	3⅜	3¾
Robert Gair, pf.	12¾	12	12¾
International Paper Co.	10¾	10⅛	10⅜
International Paper Co., pf.	57⅛	55¼	57
Johns-Manville Corp.	79	75½	78½
Johns-Manville Corp., pf.	133	132	133
Kimberly-Clark Corp.	29¼	29	29
MacAndrews & Forbes	24¾	24½	24½
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	36¼	36	36
Mead Corp.	8⅞	8⅜	8⅞
Mead Corp., pf.—A. 6%	89	85½	87½
Mead Corp., pf.—B. 5½%	75	73⅜	75
Paraffine Companies, Inc.	39¾	39¼	39½
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	13¾	11¾	11¾
Rayonier, Inc., pf.	....	....	....
Ruberoid Co.	23	22	22½
Scott Paper Co.	41¾	41¼	41¾
Scott Paper Co., pf.	114	114	114
Sutherland Paper Co.	26⅞	26¼	26¼
Union Bag & Paper Corp.	11¾	10¾	11½
United Paperboard Co.	4¾	4¼	4¾
U. S. Gypsum Co.	66	62⅜	65
U. S. Gypsum Co., pf.	176½	176	176
West Virginia Pulp & Paper Co.	14¼	14⅛	14⅛

BONDS

Abitibi Pulp & Paper Co. 5s '53	57	54⅞	57
Celotex Corp. 4½s '47	101¼	101	101¼
Certain-Teed Products Corp. 5½s '48	101¼	96¾	101¼
Champion Paper & Fibre Co. 4¾s '50	....	....	....
International Paper Co. 6s '55	106⅜	106⅛	106½
International Paper Co. 5s '47	104¼	104	104
Mead Corp. 3¼s '55	....	....	....
West Virginia Pulp & Paper Co. 3s '54	103½	103½	103½

New York Curb Exchange

High, Low and Last for Week Ending February 27, 1943

STOCKS

	High	Low	Last
American Box Board Co.	6	5¾	6
Brown Co., pf.	....	....	....
Great Northern Paper Co.	31½	30½	31
Hummel-Ross Fibre Corp.	4¼	3⅞	4¼
National Container Corp.	11⅛	9¾	11⅛
St. Regis Paper Co.	2⅞	2⅝	2¾
St. Regis Paper Co., pf.	123	122	122½
Taggart Corp.	3⅞	3¾	3⅞

BONDS

American Writing Paper Co. 6s '61	90½	90	90½

Gair Co. Votes Dividend

At a meeting of the board of directors of Robert Gair Company, Inc., New York, held on February 24, 1943, a quarterly dividend of 30 cents per share in respect of the first quarter of the year 1943 was declared, on the preferred stock of the par value of $20 per share of the company, payable April 1, 1943 to stockholders of record at the close of business on March 17, 1943 without the closing of the transfer books.

At the same meeting, the board of directors declared the full 6% interest on Robert Gair Company, Inc., income notes 1972's, payable April 1, 1943 to the holders of record at the close of business March 31, 1943.

Puget Sound Nets $2.48

Preliminary figures just released indicate that Puget Sound Pulp and Timber Company realized a net profit of $879,559 in 1942, including $176,206 from life insurance, equal after preferred dividends to $2.48 a share of common stock, of which 54 cents a share was from life insurance. Net profit was $1,076,178, or $3.08 per common share in 1941, and $795,553, or $2.40 a share in 1940.

Pulp production totaled 153,546 tons in 1942, compared with 143,038 tons in 1941, and 128,136 tons in 1940.

Net sales and other revenue in 1942 amounted to $8,932,517, largest volume of business ever done by the company, the figure comparing with $8,379,128 for 1941 and $6,022,583 for 1940.

Operating income before non-recurring items and tax provisions amounted to $2,519,175 in 1942, compared with $3,125,363 in 1941 and $1,833,248 in 1940.

Provisions for federal taxes took $1,840,000, or 72.35% of taxable income in 1942, compared with $2,046,931, or 65.5% in 1941, and $665,000 or 45.5% in 1940.

Lower operating income and net returns on the record volume of business done in 1942 reflected maintenance of the price ceiling on the company's product, while all production costs rose sharply, according to the report.

Operations were at capacity for the first nine months of 1942. Fourth quarter operations were at about 75% of capacity in October, and 50% in November and December. This curtailment was directed by the War Production Board in order to release manpower to other essential industries and logs to other war uses.

A statement covering operations of timber-producing subsidiaries acquired in latter-1941, reported that holdings of 131,358 acres on Vancouver Island, comprising 4,430,000,000 feet of fir, cedar and pulp species, were being developed. In the closing months of 1942 about 30 million feet were cut, production around year-end approximated 5 million feet a month, a figure subject to increase during 1943 provided manpower is available to carry out contemplated plans.

Rayonier Nets 15 Cents

The Rayonier, Inc., for the quarter to January 31, reports a consolidated net profit of $459,325, equal to 15 cents a common share, against $527,757, or 22 cents a share, in preceding quarter and $927,083, or 63 cents a share, in January quarter a year ago. Nine months to January 31: net profit, $1,537,623, or 62 cents a common share, compared with $2,697,826, or $1.82 a share on common for nine months to January 31, 1942.

Crown Zellerbach Earns $1.48

The Crown Zellerbach Corporation and its subsidiaries report for the nine months ended last January 31 consolidated net profit of $5,327,483, equal,

after preferred dividends, to $1.48 a common share. This compared with $7,528,819, or $2.45 a share of common, for the like 1942 period, which amount varies from that previously published because of the elimination of a provision for Canadian provincial taxes on income not required.

Net sales of the corporation and its subsidiaries, including sales of purchased merchandise, amounted to $62,055,517 for the nine months ended Jan. 31, compared with $64,267,678 for the corresponding period of the preceding year. Profit before deduction of taxes on income totaled $10,619,522, as compared with $13,979,910, a decrease of 24%.

West Virginia Nets 59 Cents

The West Virginia Pulp and Paper Company and subsidiaries for the quarter to January 31: Net profit, $764,718, equal, after preferred dividend requirements, to 59 cents a common share, compared with $1,137,939, or $1 a common share for January quarter of 1942.

Gaylord Corp. Votes Dividend

The Gaylord Container Corporation has voted an extra of 12½ cents and the regular quarterly of 12½ cents on the common, both payable March 15 to record March 8. A similar extra was paid in preceding quarters.

Bryant Earnings Off

The Bryant Paper Company for 1942, reports a net income of $231,740, against 1941 net of $314,065.

Testimonial Dinner to Paul White

Friends of Paul White, president of the Great Eastern Packing and Paper Stock Corporation, are planning to honor him with a testimonial dinner at the time of the convention and wartime conference being held in Chicago by the National Association of Waste Material Dealers, Inc., on March 16 and 17.

Mr. White as president of the Waste Paper Institute of N.A.W.M.D. and chairman of the waste paper trade committee, has been giving a lot of his time to the industry. He is particularly being honored for his efforts and his interest in connection with stimulating interest in such wartime charities as Russian War Relief, China War Relief, Red Cross and the United Nations Appeal.

That these efforts are very greatly appreciated is indicated by the desire on the part of some of his friends to honor him with a testimonial dinner.

Oxford Nets 70 Cents

The Oxford Paper Company for 1942, reports a net income of $777,336, equal to 70 cents each on 380,735 common shares after preferred dividends, compared with $1,056,841 or $1.44 a common share in 1941.

S. D. Warren Co. Votes Dividend

BOSTON, Mass., March 1, 1943—The S. D. Warren Company has declared a dividend of 25 cents per share payable March 26, 1943, to holders of record at the close of business March 17, 1943, of the common stock.

TILE CHESTS *Built to your Requirements*

KALAMAZOO tile chests can be built to your exact requirements for stock storage and bleaching. The vitrified glazed tile, made in our own tile plant, is impervious to all ordinary stock fluids and is suitable for storage of liquid alum. The smooth surface is cleaned easily and quickly with hose. Your installation can be designed for adaptation to pump delivery and agitation of any type. Our manufacturing facilities and years of experience with the paper industry are geared for immediate attention to your individual requirements. Write for complete information about prompt delivery and carefully supervised installation.

So satisfactory was the first 37-foot Kalamazoo Glazed Tile Chest installed for the Sorg Paper Company, Middleton, Ohio, that they have recently added two more. All are adapted for Shartle Bros. "Agi-Flow."

BUY WAR BONDS

GLAZED TILE

KALAMAZOO TANK & SILO CO.

KALAMAZOO, MICHIGAN

WOOD

Standardization of Bags Ordered

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 3, 1943—Standardization and simplification of grocers' and variety paper bags to conserve wood pulp, manpower and shipping space have been ordered by the WPB Director General for Operations. The amount of bags available to users will not be reduced.

The order (L-261) applies to the majority of paper bags used by grocers, department stores, 5 and 10-cent stores, dry cleaners, shoppers and similar users. It covers the following bags: Grocers, candy, garment, pants, laundry, liquor bottle, notion, millinery, shopping, and extra duty sugar. Bags for export shipment and those made to order for a specific product, such as coffee, peanuts, and flour, are exempted. There are about 2,200 types of made-to-order bags.

The order also imposes restrictions on the amount of grocers and variety bags that dealers and users may have in their inventory, and the amount of paper that manufacturers of bags may have on hand for such bags.

The effect of the order will be to eliminate non-essential bags and duplicate grades of bags. The number of bag sizes is reduced from 284 to 117, and the number of stock items is cut from 297 to 122, a reduction of approximately 60 per cent each.

The Containers Division, WPB, estimates that the order will save approximately 80,000 tons of wood pulp, and use of 4,000 freight cars, or about 10 per cent each from the estimated 1943 unrestricted use of such items. In addition, it is estimated that the order will reduce 1943 man-hours about 13 to 17 per cent below 1942.

The savings in wood pulp are accomplished by a 5 per cent reduction in the basic weight of paper which may be used in grocers and variety bags, a 4 per cent reduction in ream content, and elimination of some heavy weight papers. The savings in man-hours accrues from a reduction in the number of permitted sizes of bags, which means less handling, easier routing, and a better flow of materials and stocks to and from the plant, and a reduction in slow-moving items.

Beginning March 1, bag manufacturers may make grocers and variety bags for stock only in conformity with type, size, and paper grade specified by schedule A in the text of the order.

Effective March 1, dealers and users may not accept delivery of any stock grocers and variety bags which will increase their total inventory to more than one and one-half carloads or a 45-day supply, whichever is higher. However, they may increase the 45-day supply by an additional one-half carload of bags if it is necessary to round out a full car. Bags in transit are excluded.

If a dealer's or a user's inventory of any item is less than a 45-day supply, he may accept sufficient deliveries to increase that inventory to a 45-day supply, plus one-half carload where necessary to round out a full car.

Bag manufacturers may not accept delivery of paper, for use in the production of stock grocers and variety bags, which will increase their total inventory of paper to more than two carloads or a 45-day supply. Paper in transit is excluded. Manufacturers also may accept an additional one-half carload of paper, if it is necessary to round out a full car.

If a manufacturer's inventory of any particular size or grade of paper for manufacturing bags is less than a 30-day supply, he may accept additional deliveries to build up to a 45-day supply, plus one-half carload where necessary to round out a full car.

Chain stores and other multiple-unit organizations may, at their option, apply the inventory restrictions either to the inventory of each unit of their system, or to the collective inventory of all units.

A bag manufacturer may make, for stock, any other grocers or variety bag which will represent a paper saving over any comparable bag permitted by this order, if the bag is in sufficient demand to warrant its manufacture. However, in order to make such a bag, special advance authorization must be obtained from WPB. Application for such must be by letter outlining facts in detail.

To Hold Regional Meetings

A series of regional meetings has been scheduled by the National Paper Trade Association. These meetings will be held to discuss important actions which were taken at the War Conference held in February in New York and to emphasize the distributor's function in promoting the war effort.

The Office of Price Administration is also planning concurrent meetings in several of the same cities to inform the members of the trade as to the operation of the contemplated Overall Ceiling Price Schedule on various Wrapping Paper Products.

The following meetings have been scheduled:

Monday, March 22—Richmond, Va.
Wednesday, March 24—Ansley Hotel, Atlanta, Ga.
Friday, March 26—Baker Hotel, Dallas, Texas.
Tuesday, March 30—St. Francis Hotel, San Francisco, Cal.
Thursday, April 1—Cosmopolitan Hotel, Denver, Colo.
Friday, April 2—Palmer House, Chicago, Ill.
Monday, April 5—Kansas City, Mo.
Tuesday, April 6—St. Louis, Mo.
Wednesday, April 7—Columbus, Ohio.
Thursday, April 8—Detroit, Mich.
Friday, April 9—Syracuse, N. Y.
Monday, April 12—Boston, Mass.
Tuesday, April 13—New York City.

The foregoing tentative schedule is subject to changes and the remaining hotel listings will be given in the near future. These meetings are open to all members of the trade.

Morris M. Rothschild Dead

CHICAGO, Ill., March 1, 1943—Morris M. Rothschild, Chicago printing and paper executive. died Sunday. He was 69 years old. Mr. Rothschild was born in Germany, came to America as a child with his parents and studied at the Chicago Business University and at the John Marshall Law School.

Mr. Rothschild was president of the Greenwood Paper Company, printers, since 1895, and of the Midwest Paper Company. He was a director of Temple Isaiah-Israel. He was a member of the Chicago Historical Society and of the Standard and Ravisloe Country Clubs.

He leaves a widow, Leah, and two daughters, Mrs. Myria Lehman and Mrs. Beatrice R. Stotter of Cleveland.

Remove Limitations on Board

WASHINGTON, D. C., March 3, 1943—All limitations on production of container board, folding box board, set-up box board and special industrial boards have been removed by the WPB Director General for Operations through issuance of General Conservation Order M-241 as amended.

The amended order removes these paper products from the restricted percentage list (List A) and added them to the unrestricted list (List B). Before today's amendments, quarterly production of container board was allowed at a rate not to exceed 100 per cent calculated on the six-month base period ending March 31, 1943. An exception was container board from waste, which was on the unrestricted list. Folding and set-up box board had a quota of 80 per cent and special industrial boards 90 per cent.

Manufacture of waterproof "V-boxes" for overseas shipment to the armed forces and boxes for shipment of food and materials for military and important civilian uses have made heavy demands on the container board industry, the Pulp and Paper Division of the War Production Board announced.

These demands have brought about a shift to additional production of container board by folding and set-up box board producers who could make the change, with resultant added burden on the remaining producers in the latter fields, where requirements for items replacing scarce materials such as metal and wood have increased rapidly and exceed expectations. Reduced tonnage of wood containers for fruits, vegetables and meat packing affected the fibreboard box industry.

Substitution of special industrial boards for critical materials such as leather and for insulating materials, shell indentification tabs, gaskets, gas mask protectors, and other items associated with munitions also is increasing. Since most of the raw materials for these special boards are waste materials, lifting of quota restrictions will not affect basic pulp supplies.

Pulpwood Cut Exceeds Expectations

TORONTO, Ont., March 1, 1943—Canadian newsprint producers are naturally pleased with the announcement by the War Production Board at Washington that the second newsprint cut of 10% in consumption scheduled for April 1 has been deferred. The announcement followed representations by R. L. Weldon, Newsprint Administrator for Canada, on the pulpwood supply situation.

A greater volume of wood had been cut in Eastern Canada than was expected when the estimates were prepared last December, according to Mr. Weldon.

Three of the largest Canadian newsprint manufacturers are reported to have advised their American customers that, with the cutting season nearly completed, enough pulpwood is in sight to supply the present rate of consumption until June, 1944. One of the companies said this conclusion had been reached in consultation with other manufacturers and their woods managers, and was based on new figures not available earlier. The figures indicated a surplus of 600,000 cords as of June, 1944, not counting the wood to be brought out from the autumn and winter cutting seasons of 1943-44. This company said there may be unforeseen developments in the long range future, but it concluded that further curtailment of consumption of paper should not be blamed on lack of pulpwood in Canada.

MacArthur's Aide to Speak

Those attending the thirtieth annual dinner of the National Association of Waste Material Dealers, Inc., to be held in Chicago on the evening of March 17, will have an opportunity to listen to one of the most colorful figures that has so far come out of the War. The dinner committee has received an acceptance from Colonel Carlos P. Romulo who was the last man off Bataan. Colonel Romulo is a Filipino and a Colonel in the United States Army. In a cablegram from Australia addressed to Colonel Romulo, General MacArthur cables as follows: "Am delighted at your suggestion national lecture tour to acquaint America with the Philippine and Pacific situation. I know of no one so well qualified to do so and know of no present duty on which you could render such valuable service."

Colonel Romulo is a fluent speaker, past vice president of Rotary International and a Pulitzer prize winner. Those who can attend the dinner are sure to enjoy Colonel Romulo's address.

It is understood from the Association's Executive Headquarters in New York that a capacity audience will have the opportunity of listening to Colonel Romulo.

Those attending the Wartime Conference and planning to attend the dinner closing the Conferences should act promptly as Reservations are fast approaching the capacity of the Grand Ballroom.

R. A. Stevens on Advisory Committee

Robert A. Stevens, export manager of the Union Bag and Paper Corporation, has been invited by Hector Lazo, assistant director in charge of the Office of Export, Board of Economic Warfare, to serve as a member of an informal advisory committee which will meet with government representatives under the auspices of the Bureau of Economic Warfare to consider export problems of the paper industry. The first meeting of the committee was held in Washington on March 2.

Mr. Stevens, who has been manager of the Export Department of the Union Bag and Paper Corporation for a number of years, has been associated with paper exporting in the United States for the past forty years.

To Manage Adhesives Sales Service

Philadelphia Quartz Company, Philadelphia, manufacturers of silicates of soda and Stixso Adhesives, has announced the appointment of Robert L. Kreyling as manager adhesives sales service. Mr. Kreyling began his career with the company in 1930 as a sales representative. Since 1933 he has specialized in adapting sodium silicate to the particular needs of the fiber container industry.

Ohio TAPPI to Meet

The Ohio Section of the Technical Association of the Pulp and Paper Industry will meet at the Manchester Hotel, Middletown, Ohio, on Saturday, March 13th, at 6:30 P. M. C. S. Maxwell of the American Cyanamid and Chemical Company will discuss wet strength papers.

CONSTRUCTION NEWS

Under limitations order L-41 all projects involving expenditures of more than $5,000 must be specifically approved by the War Productions Board. The status of projects reported herewith under the provisions of the order is not known.—EDITOR.

Greenville, S. C.—The Gaylord Container Corporation, 111 North Fourth street, St. Louis, Mo., manufacturer of corrugated boxes and containers, has acquired industrial property at Gordon street and Eighth avenue, Greenville, and will occupy for new branch plant. Company will take over building at once and will begin operations at early date.

New Haven, Conn.—The New Haven Pulp and Board Company, 259 East street, manufacturer of news board, chip board and other paper board specialties, has awarded general contract to C. W. Blakeslee & Sons, Inc., 58 Waverly street, New Haven, for alterations and improvements in one of buildings at plant. No estimate of cost announced. Work is scheduled to be placed under way at once.

Marrero, La.—The Celotex Corporation, 919 North Michigan avenue, Chicago, Ill., manufacturer of building board, insulating board, etc., plans extensions in timber wharf on waterfront at main mill at Marrero, including installation of four new pile clusters and other facilities to provide for increased dock service. Application has been made to War Department for permission to carry out project and work will proceed soon.

Minneapolis, Minn.—The Waldorf Paper Products Company, Box Division, 2236 Myrtle avenue, manufacturer of folding paper boxes and containers, etc., is completing alterations and improvements in plant, for which contract recently was let to Dunnigan Construction Company, Oppenheim Building, Minneapolis, as previously noted in these columns, and will use the improved facilities at early date. No estimate of cost announced.

New York, N. Y.—American Can Company, 230 Park avenue, is now operating a subsidiary organization under name of Ammunition Container Corporation, specializing in the manufacture of fiber containers for shell service. Production is now on a capacity schedule for output for Government, and is expected to be maintained on that basis for some time to come. Company also is operating a division for the manufacture of special fiber containers for different lines of industry heretofore using metal cans.

Holyoke, Mass.—National Blank Book Company, foot of Appleton street, manufacturer of commercial paper products, has approved plans for new one-story addition to plant. General contract for erection has been awarded to the Bathlet Construction Company, 54 Appleton street, and work is scheduled to be placed under way at once. No estimate of cost announced.

Holyoke, Mass.—The American Writing Paper Corporation, 9 Main street, has begun work on improvement at its Nonotuck Division mill on Water street, for which contract recently was awarded to P. J. Kennedy & Co., 118 Race street, Holyoke. No estimate of cost has been announced.

Newark, N. J.—The Newark Paper Box Company, 216 High street, manufacturer of paper boxes and containers, has leased one-story industrial buildings on local site at 68-72 Jay street, and will occupy for expansion, primarily for storage and distributing service.

Westmount, Que.—The Albert Paper Company, Ltd., 421 Selby street, manufacturer of commercial paper products, etc., plans remodeling and improving mill, with equipment and facilities for increased capacity. No estimate of cost announced. Proposed to place work under way at early date.

Toronto, Ont.—Mundet Cork & Insulation, Ltd., 35 Booth avenue, manufacturer of insulation board and other cork board and composition board specialties, has plans under way for new addition to local plant, to be one-story, about 75 x 100 feet, reported to cost in excess of $60,000, with equipment. Bids are scheduled to be asked soon on general contract. Margison & Babcock, 210 West Dundas street, Toronto, are architects. Company is a Canadian subsidiary of Mundet Cork Corporation, Hillside, N. J.

New Companies

New York, N. Y.—Dover Products, Inc., has been chartered with capital of 100 shares of stock, no par value, to manufacture and deal in paper specialties of various kinds. Company is represented by Continental Lawyers Albany Service, 305 Broadway, New York.

Cliffside Park, N. J.—Coated Paper Industries, Inc., has been chartered with capital of 1000 shares of stock, no par value, to manufacture coated paper stocks. It is said that a plant will be operated in this vicinity. New company is represented by William Bersch, Cliffside Park.

New York, N. Y.—Paper Sculpture, Inc., has been chartered with capital of 200 shares of stock, no par value, to manufacture paper specialties of various kinds. New company is represented by Ridgeway, Ridgeway & Slote, 41 Park row, New York, attorneys.

Cost and Profit Data on Board Mills

Federal Trade Commission in its annual report states that the: Manufacturing cost and profit data covering 68 paperboard mills operated by 47 companies were gathered by the Commission for OPA in another inquiry. The report included summaries of financial condition and operating results of the companies for the years 1936-41; monthly mill operating statements and costs for specified grades of paperboard for the 68 mills; statistics with respect to average yearly wage rates and earnings; quoted or list prices of paperboard; cost per ton of various kinds of pulp, paper and other material; data on sales of paperboard by grades; determination of machines hour rates; and a description of the development of the paper and paperboard industries and their methods of products cost accounting.

Goes with W. E. Rudge

The appointment of Charles V. Morris, former sales manager of the J. E. Linde Paper Company, as a member of the sales and promotion department of William E. Rudge's Sons, New York, is announced by Frederick G. Rudge, president of the company.

"Sales development in the graphic arts is steadily becoming more dependent upon creative thinking and intelligent analysis of customer problems," states Mr. Rudge in making the announcement. "The work in which we specialize, which includes public relations and institutional promotion as well as follow-through printed advertising designed to coordinate current commercial promotion with Government wartime objectives, particularly requires this type of approach.

"We are highly gratified, therefore, to be able to add to our staff at this time a man of Mr. Morris' experience and abilities."

Mr. Morris has been with the Linde Company since 1927. In his capacity as sales manager, he was primarily responsible for the development of the highly successful Linde Clinics and of the company's house magazine, "Linde Lines." He is one of the charter members of the Graphic Arts Victory Committee and is thus familiar with the major phases of the Government's wartime promotion program. In his new post, much of his time will be devoted to projects of this type both in the interests of William E. Rudge's Sons and of the firm of Zeese-Wilkinson & Co. with which the House of Rudge is affiliated in certain fields of sales development.

Paper Indexes

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 3, 1943—Index of the value of paper mill inventories in December was 144.6 compared with 146.5 in November and 135.1 in December 1941 taking an average month in 1939 at 100 according to the monthly industry survey of the Department of Commerce.

December index of the value of paper mill shipments was 144 compared with 143 in November and 171 in December 1941 taking an average month in 1941 at 100.

The survey also shows that there was a 55% increase in 1942 over 1939 in the value of paper products while there was a 3% increase in 1942 compared with 1941.

Amsco Alloy—an Effective Weapon in Fighting Heat and Corrosion . . .

Pulp and paper mills will never be at peace with corrosion and high temperatures, which will attack their equipment, slowly or rapidly, but ceaselessly—shortening the life of parts which cannot take it and necessitating frequent replacements, often at the most inconvenient times.

But in sulfite digester practice you can have the best of this conflict by specifying for the parts exposed to corrosion and high temperature the chromium-nickel alloy which has proved its ability to resist these factors for long periods.

Amsco Alloy is the product of many years of exhaustive research toward the development of a metal with best resistance to corrosion and high temperatures. It is made in a number of grades to meet specific operating conditions.

Amsco Alloy F-12—the paper mills' own alloy—conforms to T.A.P.P.I. specifications, and has proved remarkably long-lived in sulfite digester service. Beyond heat and corrosion resistance it also has ductility to reduce the incidence of fracture from load carrying, compression and other stresses. It is moderately priced, can be readily machined, and is available in castings suitable for all digester requirements.

For further information, write for Bulletin No. 108.

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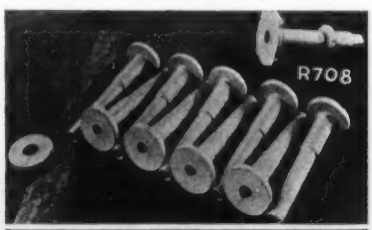
R-708 Steam nozzles.
R-538 Valve discs.



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THE AMERICAN
Brake Shoe
AND FOUNDRY COMPANY

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger
EDITOR

Vol. 116 March 4, 1943 No. 9

COMING EVENTS IN PAPER INDUSTRY

New England Section. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

Delaware Valley Section. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

Lake States Section. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Kalamazoo Valley Section. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

American Pulp and Paper Mill Superintendents Association, Twenty-fourth Annual Convention, Commodore Hotel, New York, June 15-17.

EFFECTS OF WAR

As the war affects every person the effects of the current global conflict is creating greater individual and business hardships and dislocations in direct proportion to the magnitude of the war effort. An outline study of some of the effects of the war on income, wages and living costs, prepared by the statistical department of the National Association of Manufacturers, 11 West 49th street, New York, presents in text and graphic form some of the economic changes wrought thus far in the United States with, of course, greater changes in prospect, the extent being dependent upon the duration of the conflict and the policy of the Administration.

In its introduction the study points out that, "During periods of heavy rearmament and actual warfare, there are serious distortions in the economy. These distortions are primarily due to the shift in our productive effort from peace-time goods to armaments and other war materials. We are now producing war goods at a terrific rate. This is indicated in the over-all figures of defense expenditures. Before June 1940, the federal government was spending about one and a half billion dollars for defense. Under the emergency defense program, this figure was stepped up to about 6 billion dollars for the fiscal year ending June 30, 1941. In the fiscal year 1942, we spent about 26 billion dollars for the defense and war effort and in the fiscal year 1943 we shall spend about 74 billion dollars. In the fiscal year 1944, according to budget estimate, 104 billion dollars will be spent on war. Some of this money goes for the maintenance and training of our army and navy, but the major portion of it goes for ships, tanks, planes and guns."

In discussing the dangers of inflation, the study states in part, "The rise in national income for the years 1939 through 1942, include the figures for the year 1942 as tentative estimates based on Department of Commerce data. The figures reveal a tremendous increase in national income. From 1939 through 1942, the national income increased from $70,800,000,000 to $117,000,000,000, an increase of $46,200,000,000 or 65%. The increase has been greatest in salaries and wages. In 1939, salary and wage payments were $44,300,000,000 or 62.6% of national income. In 1942 it is estimated that salary and wage payments will be $80,000,000,000 or 68.4% of national income. To make the comparison in a different way, wage and salary payments increased by 35.7 billion dollars in 1942 over 1939. This is equivalent to 77.3% of the total increase in national income which occurred during this period. It is clear, therefore, that part of the threat of inflation lies in the increase in wage and salary payments. Many of the low income groups, some of whom have been totally unemployed, and others on part-time, are now receiving increased incomes which they want, quite naturally, to spend for goods of which they have been deprived during the depression years. In estimating the inflationary gap, it is necessary to make adjustments in the total figure for national income to arrive at the figure which represents 'spendable income in the hands of individuals.' On the other hand, it is necessary to estimate the amount of goods and services available for private consumption. The Office of Price Administration has made estimates of the inflationary gap in the year 1942, based largely on Department of Commerce data. The Office of Emergency Management estimates that in the year 1942, spendable incomes will total 79 billion dollars, after deducting taxes and estimated surveys, while the supply of goods and services available for purchase will be 69 billion dollars. This leaves a gap of 10 billion dollars. The inflationary gap will widen in 1943 because of further increases in income and reduction in inventory of consumer goods."

In citing examples of the inflationary spiral at work the study explains that, "From August 1939 to May 1942, the cost of living has increased 17.6%. From September 1939 to November 1942, the percentage increases in living costs were as follows: all items, 19.1; food, 33.2; clothing, 25.6; rent, 7.8; fuel, electricity, ice, 7.7; housefurnishings, 22.4, and miscellaneous items, 11.4%. The rise in agricultural prices is reflected in the increased costs of food, clothing and to some extent in housefurnishings. Wholesale farm prices increased by 61.2% from August 1939 to November 1942. There is a lag between the rise in wholesale prices and their reflection in the rise in retail prices. It is evident that we may expect still further increases in retail food prices."

In reference to the increase in wage and salary payments, the study states that, "In August 1939, average hourly earnings in manufacturing were 63 cents. Wages began to rise early in 1940 and by December, the average hourly wage was 68 cents. The latest available figure, November 1942, shows average hourly earnings were 90 cents. It should be noted that these figures are not basic hourly wage rates. They include over-time payments, as well as increases in the basic hourly wage rates. . . . From August 1939 to August 1942, the average weekly earnings increased from $34.52 to $39.54. In 1939, factory workers averaged 38 hours per week; in November 1942, the average was 44 hours. In certain industries, such as machine tool production, the average work-week is 52.8 hours."

Commenting on profits in manufacturing the study states in part that, "While in 1940, net income after taxes, represents 7.8% of sales, the net income after taxes in 1942, according to the pending tax bill, would be only 3.9% of sales. There is nothing in this picture to indicate that most corporations are reaping 'unconscionable' profits as the result of the war effort. It should be borne in mind that this sample includes only profitable companies. If unprofitable companies were included, the picture would be much worse."

Papermaking by Dard Hunter

The history and technique of the craft of papermaking down through the ages, by Dard Hunter, has just been published by Alfred A. Knopf, Inc., 501 Fifth avenue, New York, at $4.50 a copy.

Dard Hunter has long been an outstanding authority and writer on paper and papermaking. He has written more than ten books on the subject, most of which were expensively printed on handmade paper in limited editions which sold at high prices.

This book of 398 pages, with numerous illustrations, is entirely a new publication although it contains a selection of material from other books by the author. It has been written to give bibliophiles and amateur booklovers an insight into the methods used by paper makers throughout the world, from the earliest times to date.

Although primarily an outline of papermaking, the book provides valuable information for papermakers, workers in watermarking, etchers, engravers, printers, bookbinders, paper salesmen and paper consumers.

The contents include the history of writing materials before the introduction of paper, an account of the invention of true paper by Ts'ai Lun and some of the many contributions which Chinese craftsmen have made and how paper was formed by them. The chapters on early papermaking processes, its early manufacture in Europe and America and early papermaking materials, contain much that is of historical interest. Other chapters discuss modern papermaking materials and processes. The concluding chapter contains a chronology of papermaking, paper and the use of paper.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1943		Corresponding Weeks—1942	
January 16	88.4	January 17	105.0
January 23	88.0	January 24	105.0
January 30	87.2	January 31	104.3
February 6	87.2	February 7	103.7
February 13	88.6	February 14	103.4
February 20	*88.3*	February 21	103.8

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1942	104.5	103.9	102.9	100.4	95.3	87.4	75.8
1943	*87.4*	....	....	....	....	....	....

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1942	80.8	82.8	90.6	86.8	80.1	90.5
1943	....	....	....	....	....	....

COMPARATIVE YEARLY SUMMARIES

	1936	1937	1938	1939	1940	1941	1942	1943
Year to Date..	76.0	89.2	65.1	77.9	88.2	87.0	104.1	*87.6*
Year Average..	80.4	79.8	71.5	83.4	85.6	97.4	90.5	...

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS †

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1937	83	89	89	91	88	80	69	77	72	70	57	47	75
1938	56	63	63	60	60	59	59	60	70	73	67	61	64
1939	65	73	76	74	69	73	68	77	82	91	88	77	77
1940	78	75	74	76	82	85	77	79	78	85	82	77	78
1941	81	88	89	89	91	94	92	98	95	99	98	90	92
1942	102	101	101	95	82	72	68	75	76	81	82	77	84
1943	*86*	..	..	..	..	..	..	..	..	..	..	..	..

Week ending Jan. 16, 1943—88 Week ending Feb. 6, 1943—89
Week ending Jan. 23, 1943—88 Week ending Feb. 13, 1943—87
Week ending Jan. 30, 1943—88 Week ending Feb. 20, 1943—91

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

Pairpoint Corp. Sold

NEW BEDFORD, Mass., March 4, 1942—Sale of all the remaining fixed assets, trade marks and goodwill of the Pairpoint Corporation, together with land, buildings, machinery and raw material, trucks, apparatus and furnishings now contained in the property owned by the corporation on Prospect Street, at the foot of Howland Street, to Isaac N. Babbitt and associates for a flat price of $175,000, was approved by the stockholders of the Pairpoint Corporation at an adjourned meeting held recently.

Mr. Babbitt, in connection with the transaction, announced that he plans to continue the paper mill in operation, with substantially the same personnel as is now occupied in that plant, and that the rest of the property will be developed with various diversified industrial activities not now located in New Bedford. He said that he is not now in position to disclose the identity of his associates, and that for the present, he himself is the principal in the deal.

E. T. Gardner Joins Diamond Match

Announcement was made recently that E. T. Gardner, president and general manager of the Gardner-Richardson Company, Middletown, Ohio, was appointed to the board of directors of the Diamond Match Company. Accepting the appointment, Mr. Gardner joins the board of the best known match company in America. Their numerous plants throughout the United States are engaged, to a large extent, in the war effort.

For many years Mr. Gardner has been personally interested in the business relations between Diamond Company and Gardner-Richardson Company, and as a result of this long association has become well acquainted with their many activities.

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Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY

Edited by R. G. Macdonald, Secretary

Development of Weatherproof Solid-Fiber and Corrugated Shipping Containers Designed for Overseas Shipment*

By E. R. Hankins[1]

Abstract

Initial development of corrugated and solid-fiber (paperboard) shipping cases did not involve the use of waterproof or weatherproof papers. Not until the early 20's was consideration given to this phase of the development.

A real concerted effort was not made until the start of World War II. The global nature of this war demanded that corrugated and solid-fiber containers be built to perform up to certain standards established by the Government for export shipment of foodstuffs and equipment.

This necessitated the development of highly sized paperboards having water-resisting qualities, never before thought possible.

In addition, glues of a water-resisting nature were required for corrugated and laminating purposes. Through the cooperation of the various paper mills and the glue manufacturers, both of these factors have been successfully developed.

In addition, glues of a water-resisting nature satisfactory for flap sealing were also required, and, here again, the cooperation of the various manufacturers has made this possible.

Extensive experimental work has definitely developed the fact that solid-fiber boxes made with 10-ply laminated paperboard are much stronger than a 5-ply paperboard of the same combined thickness and material. Likewise, it is true that in corrugated boxes the use of multiple-ply liners laminated with waterproof glues give best results; also that the more plies used to a given thickness of completed paperboard, the better the water-resisting qualities.

Corrugated boxes now being made with multiple plies of kraft paperboard both on the facing sheet and corrugating member have proved, through extensive tests, to possess exceedingly strong characteristics.

Various tests conducted by the Government have resulted in certain standards being established which act as a guide to the solid fiber and corrugated-box manufacturers in this development. These standards provide for four groups of boxes which are considered to meet the requirements of the Government's needs for various materials under various conditions. In these four groups both solid fiber and corrugated boxes are provided for, manufactured with highly water-resisting materials for export and Lend-Lease shipments, and also boxes constructed of waterproof materials, but not weatherproof, for the shipment of commodities within the continental limits of the United States.

Certain tests for solid fiber and corrugated shipping containers involving immersion in water for 24 hours have proved conclusively that it is possible to manufacture boxes to meet the standards established.

In the span of most of our lives we have witnessed the development of the fiber shipping case from its inception to its today's wide use. In its early stages of development it was considered more as a unit of packing rather than a shipping unit, and, as a consequence, it was confined to the shipping of light articles such as cereals, etc., which, because of their very nature, did not require a great amount of protection from outside possible damage.

The materials used in making these cases were waterproofed as much as seemed practicable at the time, and even during the first World War, nothing extraordinary was required of the fiber boxes except that they be made stronger to carry the contents safely.

Trend Toward Weatherproof Boxes

It was not until the early 20's that several manufacturers experimented with a more weatherproof case. This was accomplished through the use of an asphalt emulsion which was forced through the flutes of the paperboard by the use of compressed air. This operation offered certain manufacturing difficulties which resulted in costs considerably higher than commercial boxes. As a result the demands for a box of this kind were not considered sufficiently urgent to allow for an increased expenditure over the regular containers of as much as 10%. Consequently, little real progress was made in their development. The

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 15-18, 1943.

[1] President, Hankins Container Co., 3044 W. 106th St., Cleveland, Ohio.

uses at that time were confined to articles such as soaps, etc., having a high moisture content.

WATERPROOF AND WORLD WAR II

Due to the global nature of this war and the necessity of transportation of supplies and equipment to the far-flung posts now being occupied by our fighting men, shipping cases are required that not only stand up under exceedingly rough handling over long journeys, but which can also be unloaded from transports into the surf and stored in the open in all kinds of weather, from frigid Russia to the torrid heat of Africa. The importance of foodstuffs in this war, which have become even more of a factor than the fighting equipment itself, makes it imperative that they be transported in containers that will insure good condition upon arrival at destination. The difficulties, of course, are increased by the fact that many shipments are transshipped, either by boat, by rail or by any other modes of transportation available, and, consequently, the containers must be developed to withstand any conditions developed by any emergency.

Paper Mill Contributions

To develop these factors in either corrugated or solid-fiber boxes a more water-resisting paperboard than was ever thought possible must be used. The mills have tackled this problem, and, after many experimental runs, have succeeded in producing a board that far exceeds in water-resistant qualities anything ever produced for use in shipping containers. This paperboard, which is very closely knit in the forming, is a condensed sheet treated with waterproofing chemicals that cause it to retain a good portion of its strength while being submerged in water and regain its strength upon drying.

Waterproof Glues

It is obvious that in addition to the water-resisting paperboards, in order to have a completely weatherproof box, an adhesive that would continue to perform under water was required. The starch manufacturers came through with a modified starch adhesive, obtained by the addition of urea-formaldehyde. Considerable experimental work was necessary because of the fact that an excessive amount of urea-formaldehyde would create a brittleness of the sheet, which precluded satisfactory fabrication. The right proportions of starch to obtain maximum adhesion, combined with the right proportions of urea-formaldehyde to obtain maximum waterproofness without brittleness, was the formula sought after. This has been successfully accomplished so that today fiber shipping cases are being made that can be immersed in water for many hours and still remain shipping cases, and after drying out will regain their original strength. This type of glue is now being used on both solid-fiber and corrugated shipping cases. The solid-fiber box, however, on account of its construction and the very nature of the materials used, is more water-resisting in the early stages of immersion than the corrugated fiber box, due to the fact that the corrugations are not unlike irrigation ditches, allowing the water to come in contact with a greater area of the paper used.

Liner Fabrication—Single Ply Versus Multiple Ply

In the fabrication of liners for corrugated boxes experiments so far conducted have involved the use of single thickness as well as multiple-ply liners. This experience has proven that multiple plies laminated together with waterproof glue give the best results and that the more plies used to a given thickness of completed board, the better the water-resisting qualities. A good example of this is the fact that solid-fiber boxes made with 10-ply laminated board are much stronger than a 5-ply board of the same combined thickness and material. It is obvious, therefore, that the same theory would hold true of the corrugated box. In the use of multiple-ply liners laminated with waterproof glue definite dams are established, represented by the film of lamination which stops the penetration of moisture. When three or more liners are used it is obvious that the inner, or middle, sheet is kept much drier and retains a larger proportion of its original stiffness, inasmuch as it is affected only by capillary attraction. In laminating various plies, however, it is necessary that special attention be given to the adhesives used, which are in substance the same as used on the corrugating member, to secure the right formula to eliminate brittleness and, at the same time, obtain the maximum in waterproofness. The formulas must be adjusted to obtain these results, taking into consideration the fact that a solid coverage is obtained in laminating. Corrugated boxes are now being made with multiple plies of kraft paperboard—both the facing sheet and corrugating member. The facings are being laminated away from the corrugating machine on a separate operation and consist of two or more plies. The corrugating member is laminated on special equipment, placed just ahead of the corrugator, or just before the two sheets enter the corrugating rolls, and usually consists of two 0.010 inch sheets. Extensive tests made of containers manufactured by this process show that the boxes possess exceedingly strong characteristics.

Established Government Standards

It was necessary that certain standards be established to which solid-fiber and corrugated boxes could be developed to meet government requirements. Many tests were conducted, such as drum tests, surf tests, and drop tests. We are all familiar with drum tests and drop tests. The surf test was a special test conducted at the seashore, in which boxes representing samples submitted by various manufacturers were anchored in the surf by means of weights attached to ropes approximately 30 feet long. The result was that the boxes were carried in with the waves and carried out again as the waves receded, being subject to the excessive pressure of the water and also the abrasive action of the sand. As a result of these many tests the following standards were established: first—a dry burst (Mullen) test of 750 pounds; second—a wet burst (after 24 hours immersion) of 500 pounds; third—drop test (after 24 hours immersion) on completely filled boxes from 30 inches height on all of the corners, to a total of twelve drops. Using these tests as a standard, the all-kraft solid-fiber box made with five plies stood up better than other grades and was adopted by the Government for carrying canned goods for our Army and Lend-Lease where the shipment had to be rehandled and transported great distances; in other words, involving transshipment. Modification of these standards has since been made permitting the use of an additional three grades of boxes designed to conform to the requirements under less difficult shipping conditions, such as port to port foreign shipments involving such commodities

as writing paper and other articles which are less subject to damage, and domestic shipments.

Tentative specifications issued by the office of the Quartermaster General, dated December 2, 1942, No. 93, provide for four groups of boxes involving both corrugated and solid fiber; designed to meet their requirements for the shipping of different commodities under various conditions.

Group 1 provides for a solid-fiber box of 0.100 inch caliper having a minimum dry bursting strength of 750 pounds and a minimum wet bursting strength of 500 pounds. Also a fiber box of the same requirements, having a reinforced sisal on the outer facing. To compare with this, in Group 1 we have a corrugated box of the same bursting strength requirements, of double-wall construction, having an outer liner of 0.030 inch reinforced with sisal and center and inner liners of 0.023 inch.

Group 2 provides for a solid fiber of 0.090 inch in caliper having a minimum dry bursting strength of 550 pounds and a wet of 500 pounds. A single-wall corrugated box having an outer liner of 0.030 inch reinforced with sisal, with inner liner of 0.023 inch with a minimum dry bursting strength of 400 pounds and a minimum wet of 250 pounds.

Group 3 provides for a solid fiber box of 0.090 inch in caliper with a minimum dry bursting strength of 400 pounds and a wet of 150 pounds; a corrugated box of single-wall construction having liners of 0.023 inch and a corrugating medium of 0.010 inch, with a minimum dry bursting strength of 400 pounds and a minimum wet of 150 pounds.

Group 4 provides for a solid fiber box of 0.090 inch in thickness, having a minimum dry bursting strength of 275 pounds and no specified minimum wet bursting strength; a corrugated box with 0.023 inch outside liners and 0.016 inch inside liners with 0.009 inch corrugations, having a minimum dry bursting strength of 275 pounds and no specified minimum wet bursting strength.

These specifications also provide for a sleeve, to be made of the same materials as the box, to cover the top, bottom and ends, and is to be furnished whenever the individual use specifications require it.

The uses of these four groups are as follows:

Group 1—to be used for foreign shipments of canned goods—not only from port to port but for all foreign shipments involving rehandling or transshipment, as previously referred to.

Group 2—to be used for shipment of canned goods from port to port, only, where rehandling is not required.

Group 3—to be used for all foreign shipments for Army and Lend-Lease, for all items other than canned goods.

Group 4—to be used for domestic shipment only, within the continental limits of the United States.

It should be noted that Specification No. 93 as herein referred to is a specification for boxes and does not specify their use. The grade and style of the box to be used in the packing of particular items will be established in individual packing specifications.

Groups 1, 2, and 3 shall be manufactured of heavily sized, dense, highly water-resistant paperboard, especially made for overseas shipment, and shall be combined with a waterproof adhesive which will withstand the minimum ply separation of ¼ inch from each edge after 24 hours immersion.

Group 4 is a standard corrugated box manufactured of standard liners and combined with a commercial adhesive. This box is not manufactured of weatherproof materials or waterproof glues, as it is used for domestic shipment only.

Definite procedure is established for determining the bursting strength of boxes made under these specifications. If the paperboard slips during the tests the results must be disregarded. In testing corrugated board double "pops" are not to be considered. Six punctures shall be made—three from each side of the board. The average of the six tests shall not fall below the standard specified. If the paperboard fails to pass the tests specified, then a retest may be made consisting of 24 punctures—12 from each side. If the average of these tests meets the requirements, the paperboard will be considered to comply with the specifications.

The dry bursting tests shall be made after the paperboard has been subjected for three hours to normal atmospheric conditions of 50% to 75% R.H. The wet bursting tests shall be made after specimens of paperboard 6 by 10 inches, unscored, have been immersed in water for 24 hours at a temperature of 70 to 80° F. Immediately after being removed the ply separation of ¼ inch referred to is a voluntary separation of component plies of the paperboard at the edges of the sheets.

In addition to the above requirements, boxes made under specifications provided in Group 1, when packed and strapped in accordance with requirements, must withstand a minimum of 12 drops from a 30 inch height, immediately after 24 hours immersion in water. These drops are made in such a manner that the box strikes diagonally on a corner. The corners are numbered in accordance with a prearranged scheme, and the boxes shall be given one drop on each corner in numerical order.

These tests shall continue until the requirements have been equaled or a failure has occurred. Failure has occurred when one edge has opened the full length or any part of the contents has spilled.

The boxes manufactured under specifications in Group 2 must withstand a minimum of eight drops. Groups 3 and 4 are not required to stand any drop specifications.

Copies of this specification are available upon request to the office of the Quartermaster General.

Sealing of Boxes

Here again certain difficulties were experienced in securing a glue that would offer the maximum in adhesion when subject to immersion. The adhesive that meets the needs best is one that not only holds its bond under water, but, after adhering, forms a plastic which helps retain the original stiffness of the package. Likewise, this type of glue must be formulated to offer the maximum in water resistance and, at the same time, remain sufficiently pliable to allow for the strain involved without breaking the bond. As a further safeguard against the flaps opening up, specifications were provided for a sleeve of the same material as the container to enclose the top, bottom and ends of the box. The total package is then strapped with one round or flat wire surrounding the top, bottom and the sides. The glue used for the sealing of the flaps is similar in nature to that used in laminating and in corrugating in that it is the urea-formaldehyde formation involving the use of modified starches. It can be secured in two types—one for hand application and one for machine application.

Resistance of Sized Paper and Paperboard to Water at Elevated Temperatures*

By Philip W. Codwise[1]

Abstract

It is possible to test the internal sizing of paper and paperboard by flotation upon water at high temperatures up to the boiling point of 212° F. A rapid test for internal sizing has been presented based on flotation upon water at or close to its boiling point.

Data and curves of a wide range of sized paper products have been given showing their behavior when floated upon water at temperatures from 72° F. up to 212° F.

Many industrial processes require that the sizing of paper and paperboard be such as to resist water at temperatures considerably above that of normal room conditions. Although there is mention in the literature of the effect of temperature upon sizing tests by Libby *(1)* among others, and although Drewsen *(2)* mentions the use of a flotation test upon hot water at 180° F. as being used for paperboard, yet to the writer's knowledge no critical analysis has been published, where an examination of the action has been carried up to the boiling point of water or 212° F.

We have used a boiling water flotation test employing water at or close to 212° F. for many years as a standard test procedure. This test is now in use in a number of other paper mills and an analytical examination of its more fundamental aspects therefore seems timely.

Scope of the Investigation

This investigation will, first, discuss the relation between the time of transudation of water through the sized paper and the temperature of the water employed; and secondly, will present the "boiling water test" as a rapid and useful method of determining the degree of sizing. The latter is especially useful in estimating the size resistance of hard-sized papers and of paperboard, where ordinary test methods are more or less time consuming.

It is a well-known fact that the degree of resistance offered by the sizing in a sheet of paper to penetration of water decreases markedly as the temperature of the testing water is increased, but the exact nature of this relationship is not so well known. We are here presenting an investigation of these relations and believe that they will prove of interest, especially when their practical industrial applications are considered.

Description of the Test Method

The test method employed utilizes water of ordinary purity as recommended by Carson *(3)* in his investigation of size testing methods. This is a flotation procedure.

A sample 4 by 4 inches is cut and prepared for flotation upon water, the temperature of which is carefully maintained at that specified. To prepare the sample, all four edges of the specimen are folded up at right angles for ½ inch and may conveniently be held in place with paper clips at the corners. This forms a small tray or boat which is gently placed on top of the testing water, taking care to avoid trapping airpockets, and timed with a stop watch. The elapsed time is taken when 90% of the area has wet through and has turned dark in color, which can be accurately estimated with a little practice. The test is carried out with free evaporation from the uppermost surface. Tests are done with both the felt side and the wire side in contact with the water and may be reported separately or averaged as desired.

When carrying out the boiling water test in control work, bring the water to a boil and then keep it just below a vigorous boil, with the temperature averaging close to 212° F. and not below 206° F. It has been found that excellent check results can be obtained by taking an end point when most of the area—namely, 90% has been discolored by wetting—because this eliminates the variable results, otherwise introduced by pinholes or other possible imperfections in the test specimen.

Description of Test Specimens

In order to show the general application of this test method to paper as well as paperboard and the way in which these flotation tests at high temperatures may be interpolated to determine the resistance to water at lower temperatures two series of test results are given.

The first series embraces products ranging from 0.0065 inch up to 0.063 inch in thickness, and of varying degrees of sizing but none of them so hard-sized as not to give a definite test result except at the very lowest temperatures. These are products of varying characteristics and consist of the following:

A. A wrapping paper of 0.0065 inch caliper which is reasonably well-sized for the purpose.

B. A Six-cylinder paperboard sheet made of mixed stock calipering 0.063 inch and only moderately sized throughout.

C. A six-cylinder paperboard sheet of news calipering 0.018 inch made to resist gypsum slurry at somewhat elevated temperatures but rather soft-sized for the purpose.

D. A fourdrinier sheet of 0.012 inch. This is a moderately sized thin sheet of solid pulpboard.

In selecting this first set of sheets it seemed best to choose the more moderately sized products in order to obtain definite results over a wide temperature range.

In choosing the second set of samples we took those of increasing degrees of hardness of sizing in an identical grade and caliper of board for the purpose of showing the effects of increasing degrees of sizing in the same grade of product upon the relation of the results. Sample C above is the softest sized sample of our second series which also included Samples E, F, and G all of the identical grade

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[1] Member TAPPI; Chemical Engineer, The Beaver Wood Fibre Co., Ltd., Thorold, Ont.

but exhibiting increased degrees of size resistance.

All of these products were sized with a high-free rosin size emulsion containing 40% free rosin and set with aluminum sulphate. The rosin size was prepared by cooking F gum rosin with soda ash in the customary manner.

Flotation Test Results

The results of the flotation tests upon the first series of samples noted above are as follows. These results are shown starting with the testing water at 212° F. then reducing the temperature by 10° F. intervals to 162° F. before commencing the succeeding series of tests. We then took 20° F. intervals down to 102° F., after which the 10° F. intervals were resumed down to 72° F. Each result is the average of five determinations all of which checked well.

An analysis of these figures is most interesting as it shows that the change in transudation rate per degree Fahrenheit is considerably greater at ordinary room temperatures than it is at temperatures approaching the boiling point of water. In fact, in certain cases this change in rate may be five times the magnitude at lower temperatures than it is at the higher ones. This indicates a very real advantage in carrying out the tests at the more elevated temperatures.

Figure 1 shows this relation with the combined average results from both sides of each sample plotted against the temperature of the testing water in the case of each of the four different products. This shows without doubt that a definite relation exists between the temperature of the testing medium and the rate of penetration. The rather remarkable thing about this is that these relations continue right up to the boiling point of water in a rational manner without any break in this relationship. This is remarkable as the melting point of rosin is generally not above 170° F. and it indicates that the sizing film is not destroyed at temperatures below 212° F.

It therefore is entirely feasible to carry out sizing tests at temperatures up to 212° F. upon papers internally sized with rosin size and alum, and after this, to interpolate the results to determine what the transudation time would be when tested at any desired lower temperature even down to normal room conditions. One precaution might be mentioned here —i. e., with specialized methods of sizing the interpolation may be expected to vary to a certain extent and should be determined by practical tests.

Flotation Tests on Hard-Sized Paperboard

There is a feature of this flotation test method which deserves special comment. This is its value in testing the harder sized paperboards.

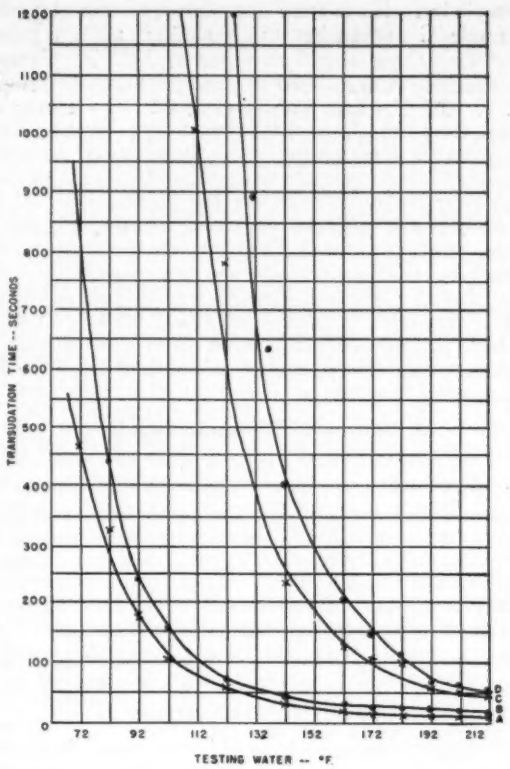

FIG. 1

Transudation Time vs. Temperature of Testing Water for 0.0065 to 0.063 Inch Products. Sample A—0.0065 Inch Wrapping Paper. Sample B—0.063 Inch Waste Paperboard. Sample C—0.018 Inch Newsboard. Sample D—0.012 Inch Pulpboard.

In order to bring out the relationship on hardsized sheets we have carried out a series of tests upon a variety of samples of the 0.018 inch caliper newsboard showing increasingly great degrees of sizing as follows. Each result is the average of five determinations all of which checked well.

These figures show the same relationship as do those in Table I and when plotted in Fig. 2 in a similar manner to the earlier tests, the curves are of the same general shape and character, offering a broad basis for belief in the soundness of this method of test.

The data in Table II bring out one important fact which we wish to emphasize. This is that even when tested at the boiling point of water there may come a point in efficient sizing methods where the sample will resist indefinitely without the water penetrating through. We have not shown tests upon such a

TABLE I

All times given in Seconds except as noted.

Temperature of Testing Water	Sample A. .0065 Wrapper		Sample B., .063 Waste Paperboard		Sample C. .018 Newsboard		Sample D. .012 Pulpboard	
	Felt side up	Wire side up	Felt side up	Wire side up	Felt side up	Wire side up	Felt side up	Wire side up
212° F.	5	6	13	13	41	49	46	43
202° F.	7	7	15	14	50	54	55	54
192° F.	8	8	18	16	59	59	65	67
182° F.	9	9	20	20	100	100	102	115
172° F.	13	12	23	22	112	108	144	149
162° F.	15	16	28	26	123	129	195	196
142° F.	29	28	41	40	232	236	409	400
122° F.	56	55	73	70	780	780	1242	1236
102° F.	106	109	158	149	1580	1614	2570	2706
92° F.	170	165	243	239	2616	2593	24 hr. +	24 hr. +
82° F.	330	329	442	435	24 hr. +	24 hr. +	24 hr. +	24 hr. +
72° F.	466	469	852	847	24 hr. +	24 hr. +	24 hr. +	24 hr. +

sample but wish to state that they are often obtained. Sample G approaches this condition as it is what we term "hard-sized" to water at 202° F.; Sample F similarly is hard-sized to water at 142° F.; Sample E at 102° F.; and Sample C at 82° F. It may be seen from the above that when the penetration time approaches 1800 seconds (or 30 minutes) the sheet is very close to being hard-sized, and we seldom conduct our boiling water tests for a greater period of time than 30 minutes. In other words, a point is soon reached after this beyond which the sheet will stand up indefinitely upon the water without soaking through and will then give a 24-hour plus test. This result we believe to be due to a condition in which the rate of evaporation from the top side is greater than the passage of water through the sample by capillary action.

A Source of Misunderstanding

This picture brings out a feature of rosin sizing of paper which is often a source of misunderstanding. There is a natural temptation to reason that the sizing results should be directly in proportion to the size and alum used, forgetting that we are dealing with a highly complicated colloidal phenomenon. As every paper technologist knows results of rosin sizing vary for no readily explainable reason and the range of test results shown in Table II might conceivably be experienced in an ordinary plant run.

Practical Applications

The practical considerations in testing the sizing of paper and paper products at elevated temperatures are most interesting and may well furnish information which could not readily be obtained by other methods. This is especially true in uses where the sized product is subjected to water solutions at temperatures above normal. Examples of this are the use of the paper or paperboard as containers for warm liquids; their use with warm adhesives; and their use in industrial processes in which warm wet mixtures must be poured upon them. A good example of this latter is the manufacture of gypsum board products.

This discussion has gone far enough into the matter to show that it is not always essential to test papers for their degree of sizing at the exact temperatures at which they are to be used; that it is often better to test them at the higher temperatures, which is especially true in cases where the exact temperature that the paper must stand is not known; and that testing them at the boiling point of water is often the most advantageous method to employ, in the interest of speed and accuracy. We find that it is generally possible to determine from the boiling water test carried out close to 212° F. what the resistance to penetration of water at lower temperatures will be by interpolation.

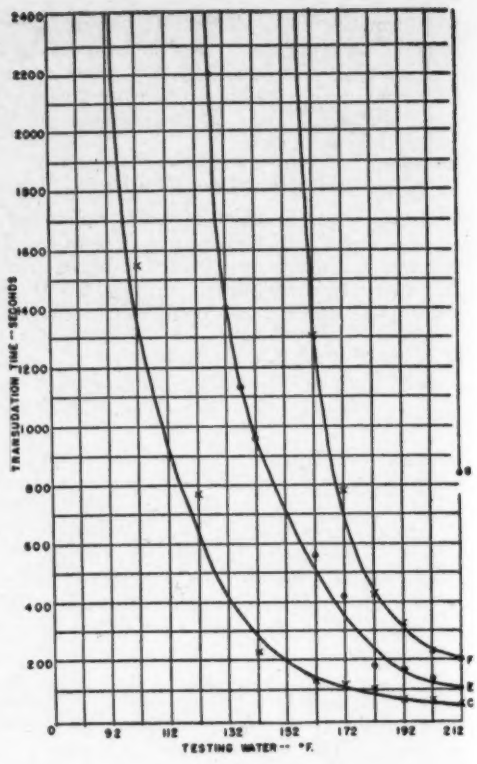

FIG. 2

Transundation Time vs. Temperature of Testing Water—0.018 Inch Newsboard.

It is entirely possible that the nature of the colloidal protecting films upon and between the fibers may vary in different sizing methods and exhibit somewhat different behavior. Therefore it should be pointed out that our data have been obtained upon paper and board, sized with a high-free rosin size, made of gum rosin, and that in the case of other types of size the behavior may be somewhat different. This however does not affect the fundamental value of the method nor alter the fact that the boiling water test is a most valuable aid in determining the degree of internal sizing of paper and paperboard.

Conclusions

1. It is entirely practical to determine the degree of sizing of paper products at high temperatures up to the boiling point of water, by the flotation method, and by interpolation judge what the size resistance will be when exposed at lower temperatures.

2. This method which, when employed near the boiling point of water, we call the "boiling water test" is most useful in determining the overall or

TABLE II

Temperature of Testing Water	Sample C.		Sample E.		Sample F.		Sample G.	
	Felt side up	Wire side up	Felt side up	Wire side up	Felt side up	Wire side up	Felt side up	Wire side up
212° F.	41 sec.	49 sec.	103 sec.	104 sec.	193 sec.	193 sec.	840 sec.	840 sec.
202° F.	50 sec.	54 sec.	141 sec.	139 sec.	237 sec.	240 sec.	24 hr. +	24 hr. +
192° F.	59 sec.	59 sec.	160 sec.	163 sec.	324 sec.	318 sec.	24 hr. +	24 hr. +
182° F.	100 sec.	100 sec.	194 sec.	187 sec.	428 sec.	430 sec.	24 hr. +	24 hr. +
172° F.	112 sec.	108 sec.	419 sec.	415 sec.	774 sec.	792 sec.	24 hr. +	24 hr. +
162° F.	123 sec.	129 sec.	555 sec.	567 sec.	1290 sec.	1314 sec.	24 hr. +	24 hr. +
142° F.	232 sec.	236 sec.	948 sec.	992 sec.	24 hr. +	24 hr. +	24 hr. +	24 hr. +
122° F.	780 sec.	780 sec.	3376 sec.	3432 sec.	24 hr. +	24 hr. +	24 hr. +	24 hr. +
102° F.	1500 sec.	1614 sec.	24 hr. +	24 hr. +	24 hr. +	24 hr. +	24 hr. +	24 hr. +
92° F.	2616 sec.	2593 sec.	24 hr. +	24 hr. +	24 hr. +	24 hr. +	24 hr. +	24 hr. +
82° F.	24 hr. +	24 hr. +	24 hr. +	24 hr. +	24 hr. +	24 hr. +	24 hr. +	24 hr. +
72° F.	24 hr. +	24 hr. +	24 hr. +	24 hr. +	24 hr. +	24 hr. +	24 hr. +	24 hr. +

internal sizing of hard-sized paper and paperboard.

3. Small differences in temperature of the testing water are generally not as important at temperatures between 200 and 212° F. as they are at ordinary room temperatures. This is an advantage of the boiling water test.

4. For all purposes requiring rapid results and where the product is to be exposed to penetration at elevated temperatures this method of test is of great practical value.

Acknowledgment

We wish to express our appreciation of the assistance given in preparing this article by LeRoy Long of our staff who did much of the testing work.

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Fiber Cans as Substitute Packages in Wartime*

By R. P. Bigger[1], F. H. Bopp[2] and T. E. Dobbins[3]

Abstract

Fiber (paper and paperboard) cans may be classified under spiral, convolute, and lap-seam constructions according to the method of manufacture. Methods used in the production of each of these types and the advantages and disadvantages of each are discussed.

Despite equipment shortages and material restrictions, fiber cans are serving adequately as substitute packages for many wartime uses. It is recognized that for certain products these substitutes possess limitations as compared to metal cans. However, the advantages of fiber cans in strength, weight and cost, and the fact that they can provide such properties as moisture vapor and grease resistance, make these containers ideal packages for a wide variety of materials.

Wartime restrictions on uses for critical metals have revolutionized packaging practices in many fields. A number of containers utilizing noncritical materials have been proposed and several types of substitute packages are now in use. One such type of substitute container that is finding increased application is the fiber can.

Fiber cans designed primarily for the packaging of dry products have been manufactured for well over fifty years. The first fiber cans were merely unprotected paperboard shells used for stable commodities such as scouring powder. At a later period sufficient protection against moisture vapor was incorporated into these shells to permit the packing of products which were more difficult to hold in a satisfactory condition under average times and circumstances of storage, such as table salt. During more recent years successful fiber cans have been designed for highly hygroscopic materials, including baking powders, gelatin dessert powders, and similar products. Use of glassine, mechanical parchment, vegetable parchment, and specially treated papers has also led to the introduction of oil and grease resistant containers.

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[1] Member TAPPI; Chemical Engineer, Research Department, American Can Company, Maywood, Ill.
[2] Member TAPPI; Chemist, Research Department, American Can Company, Maywood, Ill.
[3] Member TAPPI; Chemist, Research Department, American Can Company, Maywood, Ill.

The present emergency has caused the fiber can manufacturers to consider the packaging of such products as paint, motor oil, and many other materials which introduce new problems. When it is realized that in the United States in 1941 less than one billion fiber cans of all kinds were produced and that in the same year over half a billion metal containers were manufactured for paint and motor oil alone, the magnitude of an effort to convert production from metal to fiber containers for such products can be appreciated. To meet present demands, relatively little additional fiber can equipment of conventional type has become available to the industry. In addition, direct governmental requirements for paperboard shell and bomb containers, food ration containers, and other uses have grown steadily during the past year. To carry this tremendously increased production burden, it has been necessary not only to operate every existing machine at maximum capacity, but also to improvise methods for using other types of equipment to manufacture fiber cans.

In addition to the limited available capacity, restrictions on both fibrous and nonfibrous raw materials have further complicated the problem of adapting fiber cans to new products. By now, we are all far too familiar with this game of trying to devise substitutes for substitutes. In spite of these difficulties, it has been found possible to handle the packaging problems of many industries through the medium of the fiber can.

Types of Paperboard Cans

Conventional paperboard cans may be classified as either *spirally wound* or *convolutely wound*. In the manufacture of cans of the former type, two or more narrow plies of paper stock to which an adhesive is applied are fed from rolls onto a stationary mandrel at an angle of approximately 45° and are pulled forward and combined by the pressure of an endless belt. This results in the fabrication of a continuous tube, which is automatically cut into convenient lengths by a traveling saw. These tubes are normally of such length as to make from 4 to 10 fiber can bodies when cut to proper height in a subsequent operation. Before or after metal or paper ends are assembled, the can bodies are given any auxiliary treatment necessary to incorporate the desired properties in the can construction. This auxiliary treatment

may take the form of flushing or spraying the interior of the can or impregnation of the entire container.

In the winding of *convolute cans,* a web of paper sufficiently wide to make one or more can bodies is fed intermittently onto a revolving mandrel at an angle of 90° to the mandrel. Each revolution of the mandrel results in one ply in the can body and cans are always wound with two or more plies. The bodies are pushed along the mandrel to a label station where labels are automatically applied. The cans are then pushed off the mandrel. Subsequent operations are identical to those used in spiral can production.

Prior to the present emergency nearly all fiber cans were made on one or the other of the above described types of equipment. With the tremendously increased demands on fiber can production, it was necessary to develop new manufacturing methods. The availability of idle metal can machinery has led to the utilization of this equipment in the manufacture of so-called *lap-seam* fiber cans. In this type of container, a body blank or single ply of paper is formed, overlapped slightly, and sealed in a mandrel or horn employing the same sequence of operations as in metal can manufacture. Following this, paperboard or metal ends are applied in the normal manner.

Fiber cans are made either in composite style—i.e., with metal ends, or with paper tops and bottoms. Metal ends are seamed onto the fiber bodies in equipment similar to that used in the production of all-metal cans. The seam used, however, is not the familiar "double seam" found in sanitary cans, in which a flanged body is actually hooked and locked into a curled end, but rather a crimping of the metal end against the paper body wall.

In general, stronger and more adaptable fiber containers can be produced with metal ends. It has long been customary in the industry to utilize metal scroll shear pieces and other scrap resulting from the manufacture of metal cans for the smaller diameter fiber can ends. Under War Production Board Conservation Order M-81 as revised on December 9, 1942, such recovery pieces can be used only in fiber-bodied containers in which food for human consumption, antiseptics, and medicinal products are to be packed. As a result of this restriction, paperboard ends are necessary for products not falling in the above classifications and for all products for which larger size packages are required. A few exceptions, such as the permission to use metal ends for specified sizes of fiber-bodied paint cans for a limited period, have been made.

A variety of all-fiber ends and closures are now being used for products for which metal ends are not allowed. These include paperboard slip-cover caps, curled ends of several types and the more recently introduced seamed and plug-style ends. The seamed end is a paper counterpart of the crimped metal closure, but produced in slightly modified seaming equipment. The plug-style end can be described as a slip-cover cap with a curled edge which is inverted and inserted inside the can body with the curled edge of the cap resting on the end of the can body.

Advantages and Disadvantages

Spiral Wound

Each of the three general types of fiber cans as described above has both its advantages and disadvantages. The *spirally* wound can is perhaps the most versatile of the three, for in this construction by merely winding plies of various protection materials into the body wall, the container can be made resistant to the penetration of water, water vapor, grease or oil, acid or alkali, etc. Spirally wound containers are normally produced only in round form. The material used as the inner ply of a spiral can may be overlapped and adhered to itself with an appropriate adhesive to eliminate unprotected ply edges.

Convolute Wound

In general, *convolute* winding limits the material used to the same type of stock in each ply. This stock can be previously laminated or treated to impart such properties as moisture vapor or grease resistance. The winding of a convolute can, however, results in the creation of a raw paper stock edge in the interior of the container which, in certain cases, requires auxiliary protective treatment.

In contrast to spiral cans, convolute cans may be produced in rectangular, round, oval, or other forms. Use of convolute cans of rectangular shape results, of course, in a considerable saving in shipping space as compared to that necessary for round spirial cans of similar capacity. Where the same grade of paper and number of plies are used for both convolute and spiral cans, the convolute construction has been found to have greater strength in vertical compression. The spirally wound can will normally fail at the juncture of the spiral plies, while in the convolute can initial failure normally takes place at the top and bottom seams. Production rates achieved on spiral winders are, in general, higher than those attained in convolute winding. A fully automatic spiral line may operate at a rate of approximately 165 cans per minute, whereas approximately 70 cans per minute can be considered as good production on a convolute line.

In both of these conventional fiber can types, the protective qualities of the package may be enhanced through the use of specially treated label stocks. The utilization of metallic foils, coated, laminated, and impregnated papers as labels has increased markedly in recent years and is of particular importance at the present time in the production of waterproof and water vaporproof containers for governmental use. Convolutely wound cans lend themselves admirably to automatic labeling operations. In the case of spiral winding, a continuous label can be incorporated into the tube as the outer ply, but such a label is usually limited to an overall design. More common practices are to apply a multiple label by hand to the spiral tubes or automatically to place strip labels on the individual cans either before or after filling.

Lap-Seam Containers

As compared to spiral and convolute cans, lap-seam containers offer both advantages and disadvantages. Since the can body is restricted to one ply of paperboard, the strength of this construction is inherently limited. To attain maximum rigidity in this single ply and to provide a material which can be adapted to precision equipment, a superior grade of paper stock, usually produced entirely from virgin pulp, must be utilized. This stock, when lithographed, coated, and formed into can bodies of rectangular, round, or other shape, produces attractive packages offering such features as water vapor or oil resistance. Restrictions on the use of many of the more desirable coating materials, however, have limited the protective qualities which can at the present time be embod-

ied in lap seam containers. It is not usually considered practical to apply labels to cans of this construction and, except for the paraffin wax treatment of certain types of fiber milk containers which utilize the lap-seam construction, little auxiliary treatment of formed cans is now carried out. Theoretically, however, production rates far higher than those possible in the manufacture of spiral or convolute cans should be attainable with the lap-steam container and, with further development work, the construction may assume an important and permanent place in the industry.

Present Problems in Fiber-Can Design

During the past year many claims have been made concerning the all-inclusive efficacy of the fiber can in packaging problems. For many years the fiber container has served as a satisfactory and economical package for a great variety of products, but it cannot be offered as a panacea for all packaging ills. When however, it is used intelligently and with an understanding of its basic limitations, it can serve as a suitable wartime substitute in many fields previously restricted to metal containers.

Among the claims which have been made for some fiber containers is that they offer promise in the packaging of processed foods, beer, and vacuum-packed products such as coffee. The hermetically sealed metal cans normally used in the packing of such food products as corn and peas in the commonest consumer sizes are subjected to processing in steam at temperatures of 240 to 250°F. for periods of time varying from 30 to 90 minutes. Beer is pasteurized at a temperature of approximately 140°F. and, during this pasteurization, the internal carbon dioxide pressure may reach 75 to 100 p.s.i. Beer and other processed products are, of course, cooled in water. The vacuum packing of coffee requires a container which will hold an initial vacuum of approximately 26 inches of mercury and subsequently an internal carbon dioxide pressure of approximately 6 p.s.i. The extreme difficulty of designing paperboard containers to meet the rigorous conditions which such containers must withstand can readily be realized.

The fiber can provides an ideal package for such dry food products as salt, baking powder, cocoa, spices, and cereals; other dry products, such as scouring powder, tobacco products including snuff, dry chemicals, and drugs and a host of chemical specialties, including hair-wave pads, wallpaper cleaner, buffing compounds and bowl cleaners; some semimoist products and semisolid oils, and certain types of liquids such as milk.

In the case of each of the above products, containers have been designed to provide a maximum of product protection. Fiber cans for baking powder, for example, must be highly water vapor resistant to preserve the available carbon dioxide content of the product. These qualities may be obtained through the use of special grades of glassine-paperboard duplexed with a water vaporproof laminating agent. Spices and cocoa require containers embodying various degrees of resistance to volatile and fixed oils. Greaseproof paper stocks such as mechanical parchment or treated papers may be used for these products. It is also possible by auxiliary treatment with animal or vegetable proteins or hydrogenated vegetable or animal oils to produce grease-resistant cans. A fiber container for such a product as milk, of course, presents peculiar problems. In this case, although a high degree of waterproofness is required, the package life is comparatively short. An acceptable fiber container for milk, therefore, might be quite unsuitable for other aqueous products which are likely to be stored for much longer periods of time.

In considering present problems in fiber container design, it may be well to classify new products which require fiber packages into two groups. The first of these might include those products for which established fiber can constructions, perhaps with slight alterations, have proved satisfactory. In this classification may be placed the considerable number of items which, previous to wartime restrictions, were packed in both metal and fiber cans and which now must be converted in their entirety to fiber containers. Many of the dry and semimoist products mentioned above, as well as some dehydrated foods, fall into this group.

A second group might include those materials, representing a far greater potential volume, for which fiber cans of radically new design have been and are being developed. In addition to paint and motor oil, there are a large number of aqueous, oily, greasy, and alkaline products which must now be converted from metal to new constructions in fiber. Spirally wound, convolutely wound, and lap-seam fiber containers all have found a place in this conversion program. One of the major problems encountered with many of these products is the development of suitable paperboard closures which will permit repeated opening and closing of the containers in the hands of the customer.

The fact that some of the fiber cans now produced for such products as those listed in the second group above are offered solely as wartime substitutes is generally recognized. In some instances these substitute containers, as compared with the metal cans which they replace, provide inferior product protection, offer more difficulties in filling, shipping, and opening, and in extreme cases, may be more expensive than the original containers. Quite often these shortcomings may be traced to the necessity of producing all-fiber containers which require costly auxiliary operations performed with improvised equipment. In many such cases, composite cans would prove to be stronger and more economical.

In view of the keen competition which will inevitaby rule the packaging world after the war, the container of the future will have to offer many advantages at low cost. Advances which have recently been made in the metal can field, such as the development of resistant organic coatings and effective solder fluxes for use in the manufacture of bonderized steel and electrolytic tin plate containers, will be of great importance in this post-war picture. The newer synthetic materials, produced on a more competitive basis, will undoubtedly be put to wide usage.

The fiber can offers certain inherent advantages which, in some cases, are possessed by no other container. It is economical, light in weight and strong it is not subject to corrosion; it can be made water vaporproof, waterproof, oilproof, greaseproof, acidproof, and alkaliproof; it is easily disposed of; it can be provided with adaptable closures and, when properly made, it is an attractive package. These properties, which have enabled the fiber can to serve in so many wartime uses, should keep it in a place of prominence in the post-war packaging world.

War Time Government Specifications for Paper and Envelopes*

By M. S. Kantrowitz[1] and R. H. Simmons[2]

Abstract

This paper presents a discussion as to how and where government specifications for paper and envelopes originate. An outline is given of the changes made in Government specifications in order to conserve raw materials necessitated by the war effort.

The simplification and standardization program of the War Production Board, affecting grades, colors, sizes, and weights of paper, issued as Limitation Order L-120, is briefly discussed. The changes made in Government specifications for paper and envelopes conform to this order.

Paper and paper products constitute the largest items of purchase and are, without a doubt, of the greatest concern to the graphic arts industries. The demand for these materials has increased not only because of direct military and "lend-lease" uses, but also because pulp is needed for the manufacture of munitions.

Paper specifications are formulated by two separate committees. Those for papers purchased by the Government Printing Office are formulated by a committee appointed by the Joint Committee on Printing of Congress, while the specifications for papers not covered by the specifications of the Government Printing Office are formulated and promulgated by the Paper Technical Committee which is appointed by and acts for the Federal Specifications Executive Committee in these matters.

Committee on Paper Specifications of the Joint Committee on Printing of Congress

In accordance with Section 3 of the Government Printing Act of 1895, the Joint Committee on Printing of the United States Congress fixes standards of paper for the public printing and binding.

The Committee on Paper Specifications of the Joint Committee on Printing is composed of the Clerk of the Joint Committee on Printing, who serves in the capacity of Chairman; the Chief of Printing and Processing, Work Projects Administration; the Printing Clerk of the Post Office Department; the Inspector of Paper and Material for Joint Committee on Printing; the Chief of the Paper Section of the National Bureau of Standards, United States Department of Commerce; and three officials of the United States Government Printing Office—namely, the Technical Director, the Director of Purchases, and the Chief Storekeeper. This Committee prepares specifications on paper for public printing and binding and recommends their adoption to the Joint Committee on Printing of the United States Congress. New developments in paper manufacture and in the printing and binding industries and new requirements of all Governmental departments are considered periodically, as required, in the formulation of specifications which are approved by the Joint Committee on Printing of Congress before each contract period. As a result, a specification of the United States Government Printing Office for any grade of paper represents the latest development in that particular grade. The Government Printing Office Schedule of Paper for six-month term, beginning January 1, 1943, specifies 65 grades of paper classified under 138 items. Included in this paper schedule are all classes of paper ranging from newsprint to the highest quality of ledger and index paper. All deliveries of paper and envelopes for public printing and binding are tested by the United States Government Printing Office Laboratory for compliance with specifications.

Paper Technical Committee of the Federal Specifications Executive Committee

The Paper Technical Committee is appointed by the Federal Specifications Executive Committee of the Procurement Division, Treasury Department, of which Committee the Director of the National Bureau of Standards serves as chairman. The Paper Technical Committee is composed of the Chief of the Paper Section of the National Bureau of Standards as chairman, the Technical Director of the Government Printing Office as vice chairman and representatives chosen from the interested governmental executive departments.

This committee prepares specifications for the purchase by various government departments of such papers as blueprint, carbon paper, cross section and drawing papers, teletype, and many others pertaining to special processes or purposes for use in the field services and in the departmental services where Government Printing Office specifications do not exist.

The specifications originate either upon the request of the Procurement Division of the Treasury Department or upon request of any one government department. Proposed specifications are prepared by the Technical Committee with the assistance of representative manufacturers of the paper products involved. After a proposed specification has been developed in this manner it is forwarded to the vice chairman of the Federal Specifications Executive Committee for promulgation to the various government departments and agencies. It is also forwarded at the same time to cooperating paper manufacturers for their comments. After a reasonable lapse of time, usually amounting to three weeks, all comments received from government departments or agencies and manufacturers are referred back to the Technical Committee for final consideration. If any revision seems necessary it is made by the committee and the revised specification is forwarded to the vice chairman of the Federal Specifications Executive Committee for the approval of the Director of the Procurement Division. The specification is then printed and becomes mandatory for use by federal departments and agencies.

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 15-18, 1943.

[1] Member TAPPI; Technical Director, United States Government Printing Office, Washington, D. C.

[2] Member TAPPI; Associate Chemist, United States Government Printing Office, Washington, D. C.

Federal Specifications for Paper are Identical With Those of the Government Printing Office

In order to minimize duplication of work and to avoid inconsistency in Government paper specifications, the Federal Specifications Executive Committee in the year 1930 adopted the specifications of the Joint Committee on Printing of Congress as Federal Specifications, wherever they may be applicable and specified that revisions whenever made by the Joint Committee on Printing of Congress, be automatically included in the most recently printed federal specifications. Therefore, all federal specifications pertaining to grades of paper which are carried on the current Government Printing Office paper schedule are to all intent and purposes identical with the specifications given in that schedule.

Changes in Government Printing Office Paper Specifications

UNBLEACHED PULP IN PRINTING PAPERS

In backing the war effort, which demands every possible means of accomplishment and with economic interests in view for the conservation of chlorine, unbleached pulp has been substituted for bleached pulp not to exceed 35% of the furnish in sulphite papers wherever and to whatever degree utilitarian considerations permit without detriment to essential printing.

Nonfibrous Materials Increased

The specifications for all chemical wood writing, manifold, bond, ledger, and index papers formerly permitted a maximum of 2% ash. Effective January 1, 1943, the specifications for these types of papers have been changed to permit 5% ash in the finished product, provided that the paper fillers are not of an abrasive character so as to cause excessive wear of ruling pens or printing plates. Under such conditions paper manufacturers can use 5% filler to replace 5% of chemical wood pulp in paper to be furnished the Government. By such means a considerable quantity of chemical wood pulp has been made available for diversion to direct war uses.

USE OF GROUNDWOOD PULP

Some manufacturers stated they were ready to offer the Government Printing Office machine-coated book paper listed in the paper schedule, but were prevented from doing so because of the existing prohibition against groundwood content. The introduction of groundwood pulp into mimeograph was also requested.

In view of the shortage of sulphite pulp it was found necessary to permit approximately 60% groundwood pulp in these grades of paper.

USE OF LIGHTER WEIGHT PAPER

Another means of conserving pulp instituted by the Government was the elimination of the use of heavy weight paper where not actually necessary. For example: the substitution of 40- for 48-pound bond; 64- for 80- and 88-pound ledgers; 280- for 362-pound index; 120- for 160-pound supercalendered book; and, 100- for 120-pound machine coated paper, released to the market large amounts of pulp and saved freight, weight and pulp in the overall conservation program that is necessary in the industry at this time.

Brightness Standards

With reference to orders affecting the supply of bleached wood pulp, the percentage brightness of paper and paperboards must not be more than 5 below the maximum specified by the War Production Board for conservation of chlorine, unless otherwise agreed upon by the purchasing officer. At his discretion, he may permit, whenever necessary, both a lower brightness and a greater content of unbleached pulp than are specified. In such event, the contractor must submit a sample of the paper he proposes to furnish and if acceptable to the purchasing officer, it shall become the standard sample for the duration of the agreement.

The brightness ceilings ordered by the War Production Board are given in General Limitation, Order L-11.

The restrictions on the brightness ceilings of 100% rag content paper were removed August 1, 1942, by the War Production Board. Top brightness for this particular paper was originally fixed at 82%. It was determined that it would contribute almost nothing to the conservation of chlorine by reducing the brightness of this grade of paper.

The instruments recognized by the War Production Board for making brightness are the General Electric reflection meter or brightness tester and the Hunter multipurpose reflectometer.

SIMPLIFICATION AND STANDARDIZATION PROGRAM OF THE WAR PRODUCTION BOARD

A simplification and standardization program was issued by the Director of Industry Operations of the War Production Board in the form of a series of schedules contained in Limitation Order L-120. This order became effective July 24, 1942, was revised October 29, 1942, and amended November 30, 1942. The specifications in this program affect grades, colors, sizes and weights of:

(1) book papers used in commercial printing
(2) book papers used in the book publishing field
(3) fine writing paper
(4) chemical wood pulp tablet paper
(5) envelope papers.

Newsprint, wrapping papers, paperboard, and many types of specialty and industrial papers are not affected by this program.

In drafting the program, the Pulp and Paper Division of the War Production Board gave special attention to the small job printer. The specifications set forth will permit all printers to obtain the size sheets most suitable for their equipment. Likewise, the specifications were drawn with care not to eliminate any of the grades of paper, sizes, or colors most generally demanded or required by industry or government.

No paper manufacturer is restricted as to the quality of paper he can make. Control is exercised only over the number of grades he can make.

Schedule VI was added to Limitation Order L-120 on November 30, 1942, standardizing and simplifying the manufacture of roll toilet tissue and provided that toilet rolls be compressed in order to save shipping space and container board. It embodied the following conservation measures:

1. Reduction of toilet tissue from 18 to 14 pounds basis weight.
2. Elimination from manufacture of all rolls less than 650-sheet count.
3. Elimination of inside carton packing and individual wrapping in multiple roll units.
4. The winding of toilet rolls as tightly as equipment will permit, collapsing the roll, and designing cases so as to load cars to visible capacity.

Schedules VII, VIII, and IX of Order L-120, Standardizing and Simplifying Commercial Envelopes, Paper Stationery and Tablets, Notebooks, Pads, and Looseleaf Fillers are now in preparation by the War Production Board.

Standard Sizes in Government Printing Office

A comparison of Government Printing Office paper sizes with those recommended by the War Production Board was made and it was found that Government Printing Office sizes, although well standardized within the office did not entirely correspond to commercial practices.

This can be illustrated by the fact that the Government standard letterhead size is now 8 by 10½ inches, cut from a 21x30-inch sheet instead of 8½x11 inches, a size cut from a 17x22-inch sheet, and also by the fact that our most common Government publication sizes are 5⅞x9½ inches, sometimes in the Government Printing Office called "document" or small book size, and 9⅛x11⅜ inches, sometimes called "census" quarto size, both of which are not in accord with general commercial practice, but are standard throughout the Government service.

Restrictions on sizes are not applicable to orders of more than 5000 pounds. Since the Government Printing Office purchases much of its paper in carload lots the sizes used by that office are in conformity with the limitation order.

Army and Navy General Specifications

The Container Coordinating Committee of the War Production Board has issued (October 20, 1942) a 150-page book of Army-Navy General Specifications for Packaging, Packing and Marking for Overseas Shipment (U. S. Army No. 100-14, Navy Spec. No. 39 P-16). This supersedes 100 SSC-(A) on Ordnance Storage and Shipment Charts which has been revised and is being printed by the Government Printing Office.

This has been approved by the Army, Navy, War Production Board, Lend-Lease Administration, Agricultural Marketing Administration, and the U. S. Treasury Procurement Division. It covers most materials purchased by government agencies, except ammunition, aircraft material, subsistence items, and clothing.

Among the subjects covered are: wood and plywood shipping cases, solid fiberboard, fiber drums, multiwall paper shipping sacks, corrosion prevention, greaseproof bags, wrapping paper, folding and setup boxes, corrugated boxes, waterproof paper, cushioning materials, cordage, gummed paper tape, creped paper lining. The performance test requirements are given for each product mentioned. In a large proportion of the specifications the TAPPI Standard testing methods are indicated.

Emergency Specifications

A new class of specifications for paper and other materials is now issued by the Federal Specifications Executive Committee. These are termed Emergency Alternate Federal Specifications. They contain changes in the specifications made for temporary use for the conservation of strategic and critical materials and to take care of other supply problems arising from the war. These are issued in mimeographed form and can be obtained without charge from the Federal Catalog Division, Room 572, Procurement Division Building, Washington, D. C.

Specifications for Envelopes

The Post Office Department purchases all envelopes used by the departments and independent establishments of the Government with the exception of plain envelopes for use in Washington, D. C. The specifications are formulated by the department. Plain envelopes used by the Government Printing Office and other Government departments in Washington are purchased on specifications issued by the Government Printing Office.

Although the Federal Specifications Executive Committee requires that the federal specifications wherever applicable shall be identical with those of the Government Printing Office, the Post Office Department specifications for envelopes differed from those used by the Government Printing Office for the same grades of paper involved in their manufacture.

Post Office Department

The specifications for envelopes used by the Post Office Department in some instances permitted lower bursting strength values than the Government Printing Office Specifications. They also did not include requirements for folding endurance and acidity. This has at times placed the Government Printing Office in an embarrassing position since the envelope manufacturers, because of the less rigid specifications of the Post Office Department have preferred to bid on contracts for the Post Office Department rather than upon those of the Government Printing Office.

We have found through careful study and research that the folding endurance test is most indicative of quality. With specifications in which both folding endurance and bursting strength requirements are stated, the folding endurance is most important, and paper meeting this requirement will usually comply with the bursting strength specified. However, paper which will meet the bursting strength requirement will not always comply with the folding endurance specified.

The pH value requirement was formerly included in the Government Printing Office specifications for kraft envelopes due to the fact that some government departments, particularly Archives, use large quantities of kraft envelopes for filing purposes. The pH requirement for special purposes is important from the standpoint of permanence but is not important for envelopes used for mailing purposes. It is difficult to segregate the kraft envelopes used for filing from those used for mailing.

Suspension of pH and Fold Tests

In view of the national emergency and in the interests of unification of Government specifications the Government Printing Office suspended for the duration of the emergency period the pH and folding endurance requirements in the specifications for all envelopes purchased by this Office. This brought the Government Printing Office Specifications for envelopes in conformity with those used by the Post Office Department.

The requirement for the construction of envelopes has been broadened to permit the use of side seam as well as diagonal seam.

The weights of some of the envelopes have been reduced for the purpose of economizing on the raw materials entering into their manufacture. Some envelope sizes found no longer necessary have been eliminated.

Charges Government Wastes Paper

WASHINGTON, D. C., March 3, 1943—The Government is accused by Senator Willis, ranking Republican member of the Senate Printing Committee, of "disgracefully and shamefully" multiplying its own use of paper while calling on newspapers and magazines to curtail their consumption of newsprint, in a statement issued by him from his office.

"In 1941 the Federal government contracted for 117,173,000 pounds of paper, and actually consumed through the Government Printing Office 208,900,000 pounds, exclusive of paper consumed by the Government in other parts of the country," the statement charged.

"In 1942," the statement continued, "during all of which the nation was at war, the Federal Government contracted for 187,850,000 pounds of paper (an increase of more than 70,000 pounds over that contracted for in 1941) and actually consumed 226,000,000 pounds, exclusive of additional paper consumed in the field, an increase of 17,100,000 pounds over consumption in 1941.

"For use in 1943, the Federal Government contracted in December 1942, for 350,000,000 pounds of paper, or 60 percent more than actually consumed in 1941, the year in which American newspapers and magazines are asked to use as an even-then scaled-down base period for determining their consumption in 1943.

"But far more startling" Senator Willis continued, "and far more disgraceful at a time when the very freedom of the entire American press is threatened by Government curtailment, is the fact that in the first three weeks of this year the Federal Government in Washington alone—entirely exclusive of the rest of the country—consumed 115,545,000 pounds of the 350,000,000 pounds under contract for 1943.

"If this rate were to be maintained the Federal Government could be expected to consume more than 2,000,000,000 pounds of paper in the Government Printing Office in Washington alone in 1943, or 9.6 times as much as it consumed in 1941.

"The paper in process of being stored since January 1, 1943 in five huge warehouses rented by the Federal Government in Baltimore, New York City, Atlanta, Chicago, and San Francisco should more than guarantee 'freedom of expression' to the New Deal, even if newspapers and magazines are reduced to the size of Government questionnaires. The figures speak for themselves, disgracefully and shamefully."

Alumni Luncheons at TAPPI Meeting

An interesting phase of the annual meeting of the Technical Association of the Pulp and Paper Industry is the holding of three college alumni luncheons.

Professor C. E. Libby, head of the Pulp and Paper Department of the New York State College of Forestry at Syracuse University was honored at the annual luncheon of the syracuse graduates during the recent TAPPI Convention. Professor Libby has been with the college for over 20 years and was tendered a gift and a scroll in appreciation of the services he has rendered to the college, the paper industry and the students who have been guided by him.

Professor Libby stated that the work conducted at the New York State College of Forestry, although affected by the war, will be continued. In recognition of the importance and training given to students the Army has classified the Pulp and Paper Division as an engineering course so that students not holding reserve commissions will be given a deferred status. In addition to the regular college work, Professor Libby and his staff are actually cooperating with the War Department in problems concerning pulp and paper products.

George Sisson, one of the trustees of the New York State College of Forestry, spoke briefly outlining the problems which are confronting the Paper Industry.

Among those present were: A. H. Andersen, J. R. Atwater, P. A. Bachelder, J. C. Barthel, J. J. Becker, R. T. Bingham, L. K. Burnett, F. Casciani, C. M. Connor, T. M. Cook, S. Coppick, W. P. Dohne, S. Dowst, R. S. Duell, C. I. Gehring, S. S. Gutkin, G. B. Hanneman, P. W. Hardesty, W. O. Hisey, R. F. Huntley, E. C. Jahn, L. Justice, E. O. Knapp, E. L. Lamb, M. J. Landberge, E. R. Lang, E. P. McGinn, F. Makara, W. B. Morehouse, D. E. Murray, F. W. O'Neil, D. D. Page, N. R. Phillips, M. Plunguian, W. F. Reynolds, W. O. Roe, E. M. Root, L. E. Russell, H. M. Schulman, C. E. Snook, L. Taylor, R. H. Stevens, V. F. Waters, O. G. Weber, H. E. Weston, E. Winne, V. Woodside and R. W. Worden.

The Massachusetts Institute of Technology group met at the Technology Club of New York. John L. Parsons of the Hammermill Paper Company presided as chairman. S. W. Fletcher of the J. O. Ross Engineering Company was elected chairman for the coming year. The principal speaker was Prof. Charles E. Locke of the Mining Engineering Department, who reported on the war activities of the institute. Those present were: Charles E. Locke, S. C. Sullivan, D. B. Wheeler, R. W. Van Kirk, Paul J. Shirley, Jr., K. J. Mackeazie, W. N. Flanders, R. A. St. Laurent, Sax Fletcher, M. W. Hedden, Clyde A. Benson, James A. Lee, H. M. Hunter, R. G. Macdonald, John L. Parsons, Pierre Drewsen, Emil Creutz, G. L. M. Hellstrom, D. G. Moon, R. D. McCarron, Hermon T. Barker, Lt. Robert J. Proctor, A. M. Altieri, R. J. Clapp, William E. Rand, Robert T. Emerson, A. C. Lamoureux, George E. Calef, John Buss and H. J. Winegard.

The University of Maine group met at the Commodore. Fred Soderberg of the General Dyestuff Company, presided as chairman, and J. D. Dickson of the R. T. Vanderbilt Company, was elected chairman for the coming year. Prof. R. H. McKee of Columbia University, was the principal speaker and outlined the progress being made in the development of synthetic rubber.

Cites Texas' Paper Resources

Basic factors in Texas' future expansion as an industrial region are the use of the oil and gas resources of the state, development of bulk production of forest products, and chemical raw materials from agriculture, declares Elmer H. Johnson, industrial geographer with the University of Texas Bureau of Business Research.

As an example of Texas' industrial possibilities, Mr. Johnson cited the growing pulp and paper industry. Recognized advantages of Texas in this field are quick-growing timber, the possibility of continuing timber-cutting operations the year around, and the availability of a large area for timber-growing.

New York Paper and Pulp Market Review

Paper Market Active With Demand Maintained at Relatively High Level—Market Situation in Bleached Chemical Wood Pulp is Tight—No. 1 Mixed Paper Strong—Roofing Rags are Very Active.

Office of the PAPER TRADE JOURNAL
Wednesday, March 3, 1943.

A relatively high level of activity in the demand for major types of paper and paper board are indicated in some of the reports received from many manufacturers' representatives, jobbers, and general paper merchants during the current week. Manpower and transportation problems complicate the confused outlook for the future.

The index of general business activity for the week ended February 20 rose to 136.2, from 135.9 for the previous week, compared with 133.7 for the corresponding week last year. The index of paper board production was 142.9, compared with 136.0 for the previous week, and with 132.0 for the corresponding week last year.

Paper production for the week ended February 20 was estimated at 88.3%, compared with 103.8% for 1942, with 89.6% for 1941, with 88.8% for 1940, and with 80.6% for the corresponding week for 1939.

Paper board production for the week ended February 20 was 91.0%, compared with 102.0% for 1942, with 80.0% for 1941, with 69.0% for 1940, and with 68.0% for the corresponding week for 1939.

Wood Pulp

The supply situation in the bleached grades of chemical wood pulp continues to be reported tight. Prices are very firm. The "better than expected" supply of Canadian pulpwood indicates no shortage in this prime raw material until well into 1944.

Rags

The market position of cotton cuttings is improved, with reports indicating a firm tone in prices. Supplies are rather limited and the current volume in collections indicates no increase in supplies in the near future.

Roofing rags are very active under government requirements for the armed forces and on lend-lease commitments. Increased building for housing defense workers is also attributed as increasing the demand for building papers. Buying of old rags by felt mills is heavy and prices are very firm at the OPA maximum schedule.

Old Rope and Bagging

Mill demand for old No. 1 Manila rope continues steady at the ceiling price of $115 per ton. Prices on strings and threads are firm.

Demand for scrap bagging has improved and the price trend indicates that it may be sharply upward. Selling is in restricted volume and prices on all bagging are of a nominal character.

Old Waste Paper

The market position of No. 1 mixed paper is reported strong at this date, under a heavy demand from board mills. Reports from some quarters indicate that a price of .65 per cwt. has been paid by some mills, compared with .55 per cwt. on some sales last week. News is also in good demand, but no important changes in the price situation in this grade of paper stock has been reported at this date.

Twine

Demand for standard grades of cordage and twine continues heavy for government requirements and active for some grades for normal trade uses. The position of imported fibers is strong, with most civilian uses prohibited and obtainable only on certification of permissable use.

G. K. Hooper Talks on Twine Supply

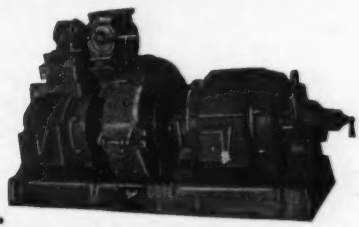
[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., March 1, 1943—The Philadelphia Paper and Cordage Association held its regular monthly luncheon meeting at the Arcadia on Friday last. George Corse of Dill & Collins, newly elected president, presided. Following the luncheon talks were given by George K. Hooper, president of Hooper Paper and Twine Company, and a former president of the association; Hugh Hanson, of W. C. Hamilton & Son, Miquon, Pa., and John Heberly, vice president of Garrett-Buchanan Company. Howard Bancroft of the Independent Twine and Yarn Company, was scheduled to speak on twines, but because of illness, Mr. Hooper was asked to pinch hit for him. All three speakers stressed the salient problems of business conditions as they apply currently to the paper and cordage business in this section.

In discussing the twine situation, Mr. Hooper said in part: "Generally speaking the twine industry is divided into five classifications, most important of which is jute, which comes from India, which produces 90% of the world's supply. Manila hemp comes from the Philippines, but because of chaotic conditions that exist we cannot get it. Then we have sisal, which is unobtainable because it comes from Java; in place of it we have Mexican hemp, and oddly enough string is regarded by some people as hemp. Sisal and manila are the only two that can be made from hemp. About October last year, the Government froze the supply of sisal and manila in manufacturing process in order that the Army and Navy requirements could be taken care of. This leaves only one thing outside of jute and cotton left to sell, which works a burden on the jute manufacturers. Twine made out of twisted paper is not very reliable because when it comes in contact with moisture and dampness it disintegrates. As I stated, the only alternative outside of jute today is cotton which, for five or six years was selling for 5c a pound, but today is selling at 19c, making the retail cost nearly 300% higher than it was a few years back. There are at least 4,000 distinct different types of twine, and it is a physical impossibility for anybody handling twines to know any more about the prices that maintain today than people handling paper know about the prices of paper."

WE MUST FIRST PRODUCE
for IMMEDIATE
DELIVERY
TO THE
AXIS

...but



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• • • •

KRAFT WRAPPING AND KRAFT ENVELOPE
KRAFT LINER BOARD
BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

MILLS:

Mechanicville, New York
Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Cass, West Virginia
Charleston, South Carolina

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL
Wednesday, March 3, 1943.

BLANC FIXE—Prices on blanc fixe are firm and unchanged and conform to prevailing market levels. The pulp is currently quoted at $40 per ton, in barrels, at works; the powder is currently quoted at $60 per ton, f.o.b., works. Demand reported good for the week.

BLEACHING POWDER — Quotations on bleaching powder are firm. Demand reported good for the week. Bleaching powder is currently quoted at $2.50 per 100 pounds, in drums, at works.

CASEIN—Prices on casein are unchanged for the current week. Standard domestic casein, 20-30 mesh, is currently quoted at 19 cents per pound; 80-100 mesh, at 19½ cents per pound. All prices in bags, car lots. Argentina casein, 20-30 mesh is quoted 9 cents per pound, c.i.f. No quotations on French casein.

CAUSTIC SODA—Quotations on caustic soda continue unchanged at prevailing market prices. Demand reported improved. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.70 per 100 pounds in drums, car lots, at works.

CHINA CLAY—Prices on china clay are firm and conform to prevailing market levels. Demand reported moderate at this date. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay from $12 to $22 per ton, at mines. Imported clay is currently offered at from $13 to $25 per long ton, ship side.

CHLORINE—Quotations on chlorine are firm and unchanged. Market strong. Government demand is reported heavy during the current week. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is reported firm for the week with higher prices on some grades. "G" gum rosin is currently quoted at $3.48 per 100 pounds, in barrels. Savannah "F" wood rosin is currently quoted at $3.42 per 100 pounds, in barrels, New York. Seventy per cent gum rosin size is quoted at $3.68 per 1100 pounds, f.o.b., works.

SALT CAKE—Prices on salt cake are firm. Demand moderate for the current week. Domestic salt cake is currently quoted at $15 per ton, in bulk; chrome salt cake at $16 per ton. All prices in car lots, f.o.b., shipping point. The quotation of $16 per ton on imported salt cake is nominal.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market levels. Demand reported good for the week. Prices on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH — Prices on corn starch are reported unchanged for the current week. Pearl is currently quoted at $3.10 per 100 pounds; powdered starch at $3.20 per 100 pounds. All prices in bags, carlot, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Demand reported light for the current week. The commercial grades are currently quoted at from $1.15 to $1.25; iron free at from $1.75 to $1.85 per 100 pounds. All prices in bags, carlots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and conform to prevailing market levels. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby carlots are quoted at $18 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $15 to $21 per ton, at mines. No quotations on imported talc.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping	$5.00	@	—
No. 1 Wrapping	4.75	"	—
Standard Wrapping	4.50	"	—
Standard Bag	4.125	"	—
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.05	"	—
White No. 1½	1.00	"	—
White No. 2	1.00	"	—
Anti-Tarnish M. G.	.95	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.35	"	—
Bleached, Jr.	2.65	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	5.50	"	5.75
No. 2 Manila Wrapping, 35 lb.	5.25	"	5.50
Boards, per ton—			
News	*48.00	@	—
Chip	*45.00	"	—
Sgl. Mla. Ll. Chip	*60.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*60.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55@$12.75	$11.70@$14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:

No. 1 Glossy Coated	$13.65@$15.50
No. 2 Glossy Coated	12.40 " 14.00
No. 3 Glossy Coated	11.60 " 13.25
No. 4 Glossy Coated	11.15 " 12.75
No. 1 Antique (watermarked)	10.25 " 11.75
No. 2 Offset	9.60 " 11.00
A Grade E. F.	9.35 " 10.75
A Grade S. & S. C.	9.60 " 11.00
B Grade E. F.	8.85 " 10.25
B Grade S. & S. C.	9.10 " 10.50
C Grade E. F.	8.55 " 9.75
C Grade S. & S. C.	8.80 " 10.00
D Grade E. F.	8.25 " 9.50
D Grade S. & S. C.	8.50 " 9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight to Destination.

Bl. Softwood Sulphite	$76.00
Unbl. Softwood Sulphite	65.00@ 66.00
Bl. Hardwood Sulphite	73.50
Unbl. Hardwood Sulphite	63.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich	72.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	62.00
S. Semi-Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	66.00
Unbl. Soda	62.00
Groundwood	46.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	$11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices.

Domestc Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1.	6.50	@	6.75
Silesias No. 1	4.50	"	4.75
New Unbleached	6.50	"	6.75
Blue Overall	5.00	"	5.25
Fancy	3.50	"	3.75
Washables	2.75	"	3.00
Mixed Khaki Cuttings	2.75	"	3.00
O. D. Khaki Cuttings	3.25	"	3.50

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Old Rags

White, No. 1—			
Repacked	*3.80	"	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

OPA Maximum Prices.

Foreign Rags

All Prices nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.00	@	4.25
Wool Tares, light	4.25	"	4.50
Wool Tares, heavy	4.50	"	4.75
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	4.25	"	4.75
Sisal Strings	*3.00	"	4.00
Mixed Strings	1.00	"	1.20

* OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.57½	"	—
Mixed Books	.85	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Mixed Ledger, colored	1.87½	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.85	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old Kraft Corrugated Containers	1.50	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
Old Corrugated Containers	.82¼	"	—
Mill Wrappers	.85	"	—

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17¼	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1	.07¼	@	.07½
New White No. 2	.04½	"	.05
Light Silesias	.04½	"	.04¾
Silesias, No. 1	.04	"	.04¼
Black Silesias, soft	.03¾	"	.04
New Unbleached	.07¼	"	.07½
Washable Prints	.03¾	"	.03½
Washable No. 1	.02	"	.02¼
Blue Overall	.04½	"	.05½
Cottons—According to grades—			
Washable shredding	—	"	.01¾
Fancy Percales	.03¼	"	.03½
New Black Soft	.02¾	"	.03
New Dark Seconds	1.75	"	2.00
Khaki Cuttings—			
No. 1 O. D.	.03	"	.03¼
No. 2 Mixed	.02¼	"	.02½
Corduroy	.01¾	"	.02¼
New Canvas	.04¾	"	.05¼
New Black Mixed	—	"	.02½

Domestic Rags (Old)

White No. 1—Repacked	3.80	"	—
White No. 2—Repacked	2.90	"	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	"	3.50
Sisal Rope	3.75	"	—
Mixed Rope	.75	"	1.00
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Ledger, colored	1.87½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Box Board Cuttings	.72½	"	—
Jute Corrugated Cuttings	.90	"	—
Overissue News	.85	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Overissue News	.85	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old Corrugated Containers	1.00	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	3.75	@	—
Sisal Rope No. 1	4.00	"	—
Sisal Rope No. 2	3.00	"	—
Mixed Rope	1.35	"	1.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.75	"	5.25
Jute Carpet Threads	3.25	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.75	"	4.00
Wool Tares—			
Foreign	(nominal)		
Domestic	3.75	"	4.00
Aust. Wool Pouches	4.75	"	5.00
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.50
Paper Mill Bagging	2.50	"	3.00
No. 2 Bagging	1.35	"	—*

* OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¾	"	.05
New White No 1.	.06¾	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06½
Underwear Cutters, Bleached	.06¾	"	.06¾
Underwear Cutters, Unbleached	.05¾	"	.06
Silesias No. 1	.06	"	.06¼
New Black Silesias	.03	"	.03½
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06¾
Blue Cheviots	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¼	"	.03½
New Canvas	.06¼	"	.06¾
B. V. D. Cuttings	.06¾	"	.06¾

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—*
Miscellaneous	3.20	"	—*
White No. 2—			
Miscellaneous	2.65	"	—*
Twos and Blues, Repacked	2.20	"	—*
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—*
Miscellaneous	1.80	"	—*
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—*
No. 2	1.45	"	—*
No. 3	1.35	"	—*
No. 4	1.35	"	—*
No. 5, Quality A	1.35	"	—*
Quality B	1.20	"	—*
Quality C	.95	"	—*
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices.

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 White Ledger	2.17½	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—